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A MONOGRAPH OF *GYRELMIS* GEN. N., WITH A STUDY OF THE VARIATION OF THE INTERNAL ANATOMY (COLEOPTERA, ELMIDAE)

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(*Department of Entomology, British Museum (Natural History).*)

With 74 Text-figures.

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Introduction.

This monograph is one result of an expedition to Brazil and French Guiana which I undertook in the summer of 1937. During the expedition a large amount of material was collected of a new genus of the Elmidae. All together eleven new species and one new subspecies are described. Examples of the majority of these were dissected to discover what kind of characters of the soft parts of the internal anatomy are of generic and what of specific importance; and the results are summarised in a separate section of this paper. So far as I know, a study of the variation in the internal anatomy of many species in one genus has not been made before in any group of the Arthropoda.

Acknowledgments.

I am grateful to the Managers of the Balfour Fund (University of Cambridge) for a grant of £200 and to those of the Worts Fund for a grant of £40 which made it possible for me to collect in South America.

Method.

All of the material of the new species was collected in Pampel's Fluid (Imms, 1939), and dissections of the internal anatomy were made in this medium. The dissections were stained in haematoxylin and mounted in balsam. The haematoxylin was dissolved in dilute alcohol and enough acetic acid added to change the colour to a dark amber, so that dissections could be left in the stain up to several hours without risk of overstain. The sclerotised parts of the male

genitalia were treated with warm 10% potash, as boiling frequently caused distortion.

All illustrations were made by me with the aid of a camera lucida; and lines next to figures correspond to a length of 0·20 mm. unless otherwise indicated.

Descriptions of the species were done for the most part under a magnification of × 75. During the description of the species the problem arose as to how far the descriptions should be complete. To describe and illustrate in detail every structure on the body of each species is for all practical purposes an impossibility which is generally recognised. Any modification of this procedure rests upon the judgement of the individual worker. Some solve this problem by describing only those characters which will enable one to separate the species from those already described in the genus. In practice this means that each time a new species, which differs in structural details from those previously described, is added to a genus it becomes necessary to re-examine and re-describe all the species: and if such a standard is accepted, whenever species are added to a genus, all other specific descriptions in that genus must be revised. Fortunately, a slightly higher standard generally prevails to-day. The systematist selects from the characters that he sees those which by comparison with other species of the genus, or by analogy with the species of related genera, appear to him to be important: and to these he adds a few characters which he thinks are likely to prove useful when more species are known, but makes no attempt at anything approaching a complete description.

It has already been pointed out that a really complete description is a practical impossibility and that anything short of this must, at least in the case of those genera to which many species will be added, involve a certain amount of re-description. The amount of re-description necessary is governed largely by the number of species later added to the genus and the accuracy and completeness of the existing specific descriptions. Although all re-description cannot be avoided, an attempt is made here to describe and figure each species in such detail that it will be reduced to a minimum. However, if other criteria are in the future needed to distinguish satisfactorily the species of *Gyrelmis*, *e.g.* the number of branches of the recurrent nerve or the biochemical properties of some tissue, the descriptions given here will have to be rewritten.

Material.

A summary of the material before me is as follows:—

1.	*Gyrelmis glabra* sp. n.	7
2.	,, *spinata* sp. n.	79
3.	,, *simplex* sp. n.	240
4.	,, *obesa* sp. n.	26
5.	,, *rufomarginata* (Grouv.)	1
6.	,, *thoracica* sp. n.	800
7.	,, *thoracica basalis* subsp. n.	285
8.	,, *pusio* sp. n.	17
9.	,, *longipes* sp. n.	65
10.	,, *maculata* sp. n.	132
11.	,, *brunnea* sp. n.	391
12.	,, *pulchella* sp. n.	2
13.	,, *nubila* sp. n.	18
	Total number of specimens	2063

Variation of the internal anatomy.

Among the Arthropods there are to-day practically no studies on the interspecific variation of the internal structures within a genus, and the same is true for intraspecific differences. Both are necessary before the classification of the lower categories in the taxonomic hierarchy can be put on a sound basis. With this in mind, it has been thought worth while to make a brief summary of the variations found while attempting to discover which were specific and which were generic characters in *Gyrelmis*. Altogether 57 specimens, including ten of the twelve species before me, have been dissected; and the interspecific and intraspecific variations will be considered together.

The digestive system.

The alimentary canal (figs. 3, 6–7) has a narrow pharynx followed by a slightly broader oesophagus which has the posterior end invaginated into the mid-gut to form the cardiac valve. The mid-gut is a straight tube which occasionally, particularly near its posterior end, has a few feebly projecting regenerative crypts. The anterior margin always has five or six caeca distributed among the species as shown in table 1. When there are only five

TABLE I.

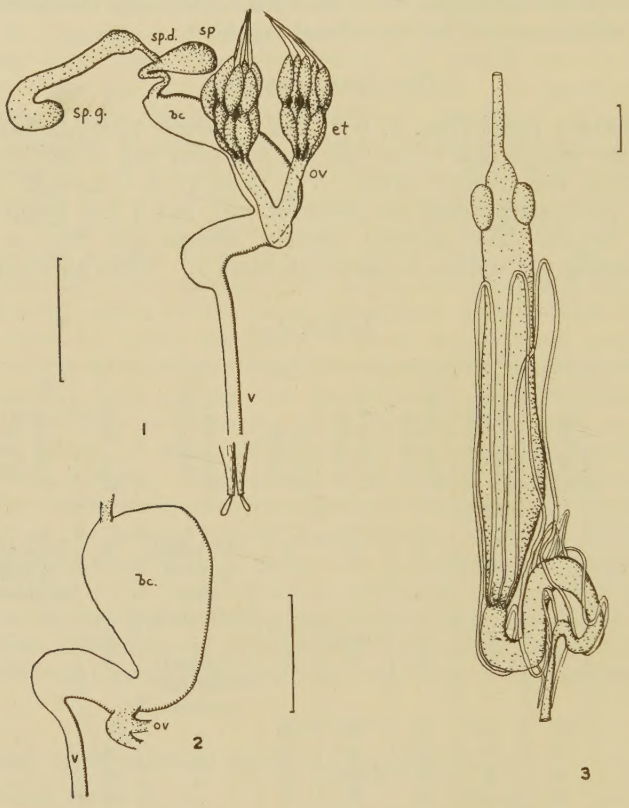
Species	Number examined	Caeca on mid-gut	Malpighian tubules	Abdominal ganglia	Sperm tubes	Vesiculae seminales	Egg tubes	Opening of sperma-theca	Type of ♀ accessory gland
glabra . .	1	5	—	—	—	—	—	—	—
spinata . .	4	6	6	2	2	Proximal part of vasa deferentia	6	Into apex of bursa copulatrix	Simple tubular
simplex . .	4	6	6	1 or 2	2	,,	6	,,	,,
obesa . .	4	6	6	3	2	Special tubular pockets	6	,,	,,
thoracica . .	12	5 [1]	6	3	2	,,	6	,,	,,
pusio . .	9	5	6	2 [2]	2	,,	6	,,	,,
longipes . .	5	6	6	2 or 3	2	,,	6	,,	,,
maculata . .	9	5 or 6	6	3	2	,,	6	,,	,,
brunnea . .	5	5	6	3	2	,,	6	,,	,,
nubila . .	4	5	6	3	2	,,	6	,,	,,

[1] In one specimen there are two small ventral caeca so that total number is six, but this can be considered to be an abnormal condition.

[2] Third abdominal ganglion is just distinguishable as discrete.

caeca, there are two on each side and one ventral. When a sixth is present it is always on the dorsal side, though of the twelve specimens of *G. thoracica* sp. n. examined, species normally having five caeca, one specimen had a small extra caecum developed between the ventral and left ventro-lateral one. However, this can be considered to be an abnormal condition. Of the nine specimens of *G. maculata* sp. n. examined for this character two females and two males had six caeca and three males and two females had five. In some insects, *e.g.*

Orthoptera, a difference in the number of caeca is of family importance, in other groups of the ELMIDAE it is a good generic character, while in certain sections of some genera of the same family, *e.g. Macrelmis* Mots., *Gyrelmis* gen. n., and *Elsianus* Sharp, the number of caeca may differ among individuals of the same species. The caeca vary in size in the same individual (figs. 6–7), and different individuals show a considerable variation in average length of caeca. The ventral caecum appears to be always smaller (a fourth to three-fourths) than the lateral caeca, and when a dorsal one is present it is always smaller than



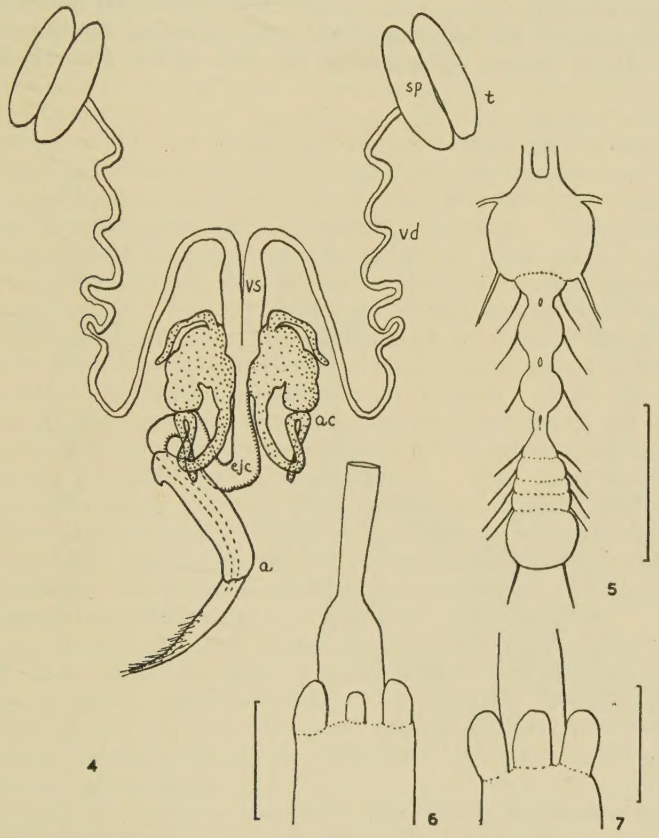
FIGS. 1–3.—*Gyrelmis brunnea* sp. n. (1) Female reproductive system, (2) Bursa copulatrix filled with sperm, (3) Dorsal view of alimentary canal. (bc) Bursa copulatrix, (et) Egg tubes, (ov) Oviduct, (sp) Spermatheca, (sp. d.) Spermathecal duct, (sp. g.) Spermathecal or accessory gland, (v) Vagina.

the ventral. The ventro-lateral are generally longer than dorso-lateral. In some instances one or more caeca are bent or come to lie partly over their neighbours. For example, of the five individuals of *G. obesa* sp. n. examined one had the right dorso-lateral caecum lying over the right ventro-lateral.

The number of Malpighian tubules is always six. They are always pale in colour, none being highly coloured as is the case among species of other genera. All end freely in the body cavity near the rectum. The hind gut has a large loop in the abdomen. The shape of the loop is controlled largely by the amount of food in the gut.

The nervous system.

The central nervous system (figs. 5, 9–10) always has three discrete thoracic ganglia, and there may be one to three discrete abdominal ganglia. The first is always partly fused to the third thoracic, and the second is always discrete. The third was partly fused to the terminal ganglion in one of the four specimens of *G. simplex* sp. n. examined, while in the other 56 specimens of nine species it was always discrete. The fourth was always discrete in five of the nine species, in one it was sometimes discrete and sometimes fused, while in the other



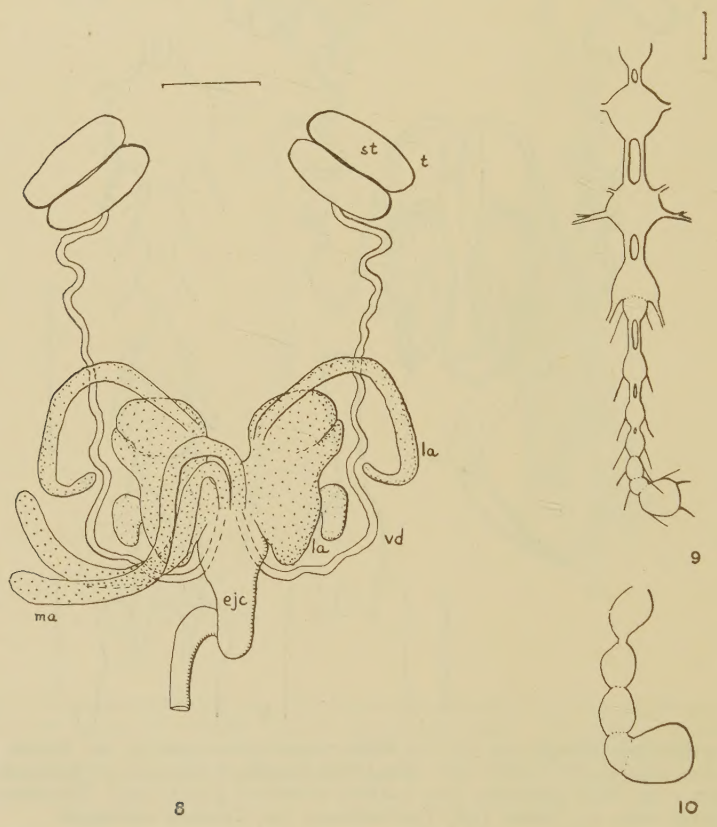
FIGS. 4–7.—*Gyrelmis spinata* sp. n. (4) Male reproductive system, (5) Dorsal view of abdominal ganglia, (6) Dorsal view of anterior margin of mid-gut, (7) Same of another specimen. (a) Male genitalia, (ac) Lateral accessory gland, (ejc) Ejaculatory duct, (sp) Sperm tube, (t) Testis, (vd) Vas deferens, (vs) Vesicula seminalis.

three it was always fused to the terminal ganglion. The degree of fusion of the abdominal ganglia is to some extent positively correlated to the body shape, *i.e.* in the broadly oval species, such as *G. spinata* sp. n. and *G. simplex* sp. n., there are never as many as three discrete ganglia, while in the obovate species there are nearly always three. The number of discrete ganglia bears no relation to the sex of the individual as has been shown to be the case in other groups, *e.g.* Mecoptera (Potter, 1938). The intraspecific variations in the form of the abdominal ganglia are very great and are not correlated to the sex of the

individual. These variations are of two types : (1) the shape of any individual ganglion, particularly the terminal ones, may vary from being broadly oval to elongate or one side may be flattened so that the shape is asymmetrical; and (2) the last two or three ganglia may be partly twisted (fig. 9) or bent (fig. 10) from their normal position so that they come to lie dorsally or dorso-laterally to the preceding ganglia.

The female reproductive system.

The female reproductive system (fig. 1) is similar in the different species. The variations noted in size and shape may all be accounted for by differences in the absolute size of the species and the stage of sexual development of the individual. Apart from a difference in the size of the ovaries due to the



Figs. 8–10.—*Gyrelmis longipes* sp. n. (8) Ventral view of male reproductive system, (9) Dorsal view of central nervous system, (10) Left lateral view of terminal abdominal ganglia, (ejc) Ejaculatory duct, (la) Lateral accessory gland, (ma) Vesicula seminalis, (st) Sperm tube, (t) Testis, (vd) Vas deferens.

ripening of the eggs, the bursa copulatrix differs greatly in shape, depending on how full it is of sperm. When it is empty or nearly so (fig. 1) it is more or less parallel and about four times as long as broad, but when it is full (fig. 2), the ratio of length : breadth is much less, and this organ may be nearly round.

The male reproductive system.

The male reproductive system (figs. 4, 8, 11–16) of several specimens of each of nine species was examined. Both interspecific and intraspecific variations were found to be very great. Little can be said concerning intraspecific variations since it was not possible to separate these variations from those due solely to a difference in the degree of sexual development of two or more individuals. There are always two sperm tubes to each testis, and these lie dorsally or dorso-laterally to the gut in the abdomen. As the individual matures sexually, the testes increase in size and may extend from the middle of the abdomen into the mesothorax. In sexually mature individuals the testes have changed in shape from oval or nearly parallel (fig. 4) to very elongate and outwardly curved (fig. 15). As is always the case in the ELMIDAE when there are two or more sperm tubes to each testis, each sperm tube is connected to the vas deferens by a short vas efferens. In other genera studied the vasa efferentia were narrow, but in *Gyrelmis* they are much swollen and may serve as endodermal vesiculae seminales, though in all species there are much larger vesiculae seminales developed from the ectodermal part of the vasa deferentia.

The vasa deferentia are much-coiled and bent tubes. The number of coils and bends and their diameter were found to be more or less different in every individual examined, and in the various illustrations these characters are only approximate. The proximal ends of the vasa deferentia are modified to form vesiculae seminales. The species may be divided into two distinct groups (with a number of correlated external characters, *vide* key) on the manner in which the vesiculae seminales are formed. In the first group the sperm is stored in an enlarged section of the proximal end of the vas deferens (figs. 4, 14), while in the second group there are special tubular pouches developed for the storage of sperm (figs. 8, 11–13, 15–16). That these pouches are not median accessory glands was proved by dissection. Similar pouches in other groups of Coleoptera have generally been described as median accessory glands. The shape and size of these pouches varies very much with the sexual maturity of the individual. The pouches are nearly always folded posteriorly over the accessory glands, and frequently one pouch lies over the other.

There is a lateral accessory gland on each side of the distal end of the ejaculatory duct. Each accessory gland possesses one or more lobes. The shape of the accessory gland and its lobe or lobes are usually good specific characters but should be used with great caution as their relative size varies with the sexual development of the individual. In addition, they are sometimes folded in various ways.

The ejaculatory duct is a muscular tube which, when the genitalia are retracted into the abdomen, is variously coiled. Anteriorly it is broad but becomes narrower posteriorly. It extends through the middle of the basal and median lobes. It opens externally at a point about the middle of the length of the median lobe. Its long and slender end is invaginated, but when the individual is copulating, it is exserted.

Gyrelmis gen. n.

Body obovate or broadly oval. Hairy or scale-like tomentum confined to following areas: (1) genae; (2) hypomera; (3) epipleura (except in *glabra* sp. n.); (4) sides of prosternum, mesosternum, metasternum, and abdominal sternites; and (5) part of coxae and all or part of trochanters,[1] femora, and tibiae. *Head* when seen from below capable

[1] The concealed part of the trochanters is always glabrous.

of being retracted so that none of mouth-parts is visible. Antennae (fig. 17) 11-segmented. Mandible (fig. 20) with two or three apical teeth; prostheca large, entirely membranous, and with numerous hairs. Maxilla with palp (fig. 19) 4-segmented and stipes with well-developed palpifer; galea and lacina separate, broad, and apex of each with dense spines or hairs. Labium with palp (fig. 18) 3-segmented and prementum without a distinct palpiger. Mentum transverse, usually slightly broader and shorter than submentum. Gula anteriorly a fifth to half as broad as submentum, parallel or with sides converging, or (some specimens of *G. thoracica* sp. n.) confined to anterior half as gular sutures are confluent posteriorly. *Pronotum* with anterior margin strongly arcuate at middle and on each side behind eye before apical angle deeply and narrowly sinuate; posterior margin trisinuate, broadly and deeply so on each side and more narrowly and shallowly so in front of scutellum. Pronotum on each side with sublateral carina, which may be complete,

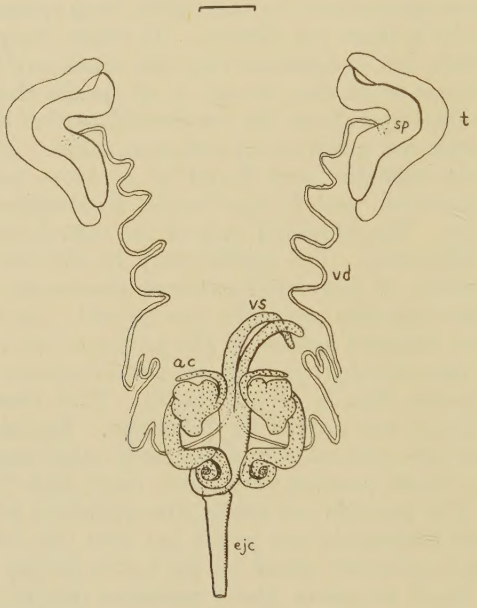


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Fig. 11.—*Gyrelmis maculata* sp. n. Male reproductive system. (ac) Lateral accessory gland, (ejc) Ejaculatory duct, (sp) Sperm tube, (t) Testis, (vd) Vas deferens, (vs) Vesicula seminalis.

confined to basal region, or even absent; disk evenly convex and without impressions. *Elytra* striate and punctate; each elytron with two sublateral carinae, one on fifth and one on seventh interval. *Hind-wing* (fig. 62) reduced or fully developed; without an anal lobe; without a radial cross vein or an anal cell; first anal present apically; second anal with first and third or only with third branch present, second branch always absent; third anal joined to second anal and without a branch; fourth anal well developed; radio-medial cross vein present or (*G. pusio* sp. n.) absent; and cubito-anal cross vein present though not always complete. *Prosternum* (figs. 28 and 61) moderately short in front of anterior coxae; prosternal process moderately long, very broad, and with posterior margin broadly truncate, broadly rounded, or narrowly produced at middle. Mesosternum with a deep and broad groove for reception of prosternal process. Abdomen with middle basal margin of first sternite very broad and feebly rounded. *Legs* with visible portion of front

coxae nearly round and trochantin completely concealed by hypomera and sternum. Claws slender or stout and with or without a basal tooth. *Alimentary canal* (figs. 3, 6–7) with five or six caeca on anterior margin of mid-gut; if with five caeca then never with a dorsal caecum. Hind gut with six Malpighian tubules which end freely in the body cavity near the rectum. *Male reproductive system* (figs. 4, 8, 11–16) with two sperm tubes to each testis; vesiculae seminales are either swollen ends of vasa deferentia or special tubular pockets; accessory glands lobed. *Female reproductive system* (figs. 1–2) with six egg tubes to each ovary; spermathecal duct opening into apex of bursa copulatrix; accessory gland simple, long, and tubular. *Central nervous system* (figs. 5, 9–10) with three discrete thoracic ganglia; abdominal ganglia with first always fused to third thoracic, second always discrete, third usually discrete, and fourth often discrete.

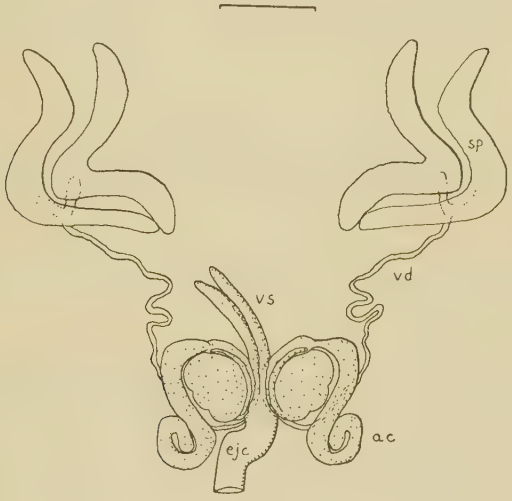

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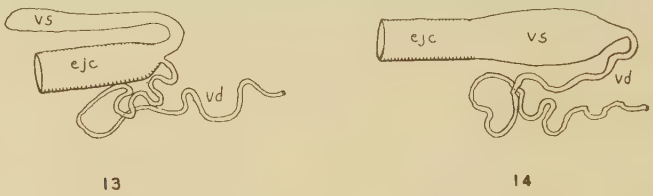
Fig. 12.—*Gyrelmis nubilia* sp. n. Ventral view of male reproductive system. (ac) Lateral accessory gland, (ejc) Ejaculatory duct, (sp) Sperm tube, (t) Testis, (vd) Vas deferens, (vs) Vesicula seminalis.

Genotype: *Gyrelmis brunnea* sp. n.

Of the known genera, *Gyrelmis* appears to be most closely related to *Heterelmis* Sharp, but differs in many important particulars as follows: (1) the pronotum never has a transverse impression, whereas *Heterelmis* usually has one; (2) the sublateral carinae of the pronotum are often confined to basal region, whereas in *Heterelmis* they always extend from base to, or very nearly to, apex; (3) the hypomera are entirely clothed with tomentum, whereas in *Heterelmis* the tomentum is restricted to a ventral belt; (4) the sublateral carinae of the elytra are on fifth and seventh instead of sixth and eighth intervals; (5) each ovary has six egg tubes, whereas in *Heterelmis* each ovary has about eleven; and (6) the second, second and third, or second, third, and fourth abdominal ganglia are discrete, whereas in *Heterelmis* the first six are discrete.

Gyrelmis resembles *Heterelmis* in its general shape and appearance, presence of sublateral pronotal carinae, presence of two sublateral carinae on each

elytron, wing venation, and somewhat similar prosternal process. The internal structures of the two genera have many points in common. In both the alimentary canal has six caeca on the anterior margin of the mid-gut (about half the species of *Gyrelmis* have only five) and has six Malpighian tubules. The male reproductive system is likewise similar in having two sperm tubes to each testis and lobed lateral accessory glands. The female reproductive system differs mainly in the number of egg tubes to each ovary but the bursa copulatrix, spermatheca, and accessory gland are very similar in shape.



Figs. 13–14.—(13) Diagramatic view of type of reproductive system present in majority of species of *Gyrelmis*, (14) Same of reproductive system present in *G. spinata* sp. n. and *G. simplex* sp. n. (ejc) Ejaculatory duct, (vs) Vesicula seminalis, (vd) Vas deferens.

The characters of most importance in distinguishing the species of *Gyrelmis* appear to be the following :—

(1) General proportions, length and breadth. Colour.
(2) Distribution of tomentum on epipleura, prosternum, metapleura, and legs.
(3) Size and distribution of punctures on the various sclerites.
(4) Shape of pronotum.
(5) Extent and prominence of sublateral pronotal carinae.
(6) Shape and extent of impression near base of pronotum on each side of scutellum.
(7) Prominence and extent of sublateral carinae of elytra.
(8) Condition of elytral striae and intervals.
(9) Extent and form of prosternal carinae.
(10) Shape of prosternal process.
(11) Prominence of metasternal carinae and whether parallel or diverging.
(12) Condition of carinae of first abdominal sternite.
(13) Length of last tarsal segment relative to combined length of four basal ones.
(14) Type of claw—slender, without a tooth or broad with a more or less basal tooth.
(15) Secondary sexual characters.
(16) Structure of male genitalia. No two species are known to have similar genitalia.
(17) Number of caeca on anterior margin of mid-gut.
(18) Type of vesiculae seminales.
(19) Shape of lateral accessory glands of male.

The following secondary sexual characters have been noted in the species at hand :

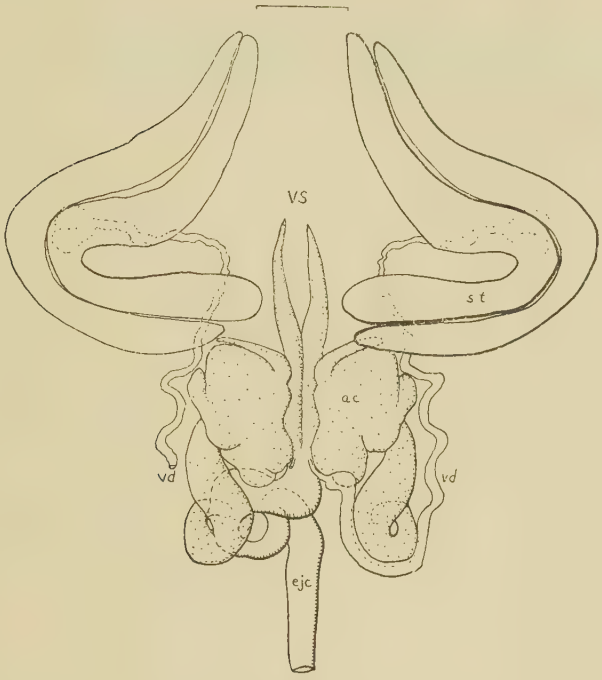


Fig. 15.—*Gyrelmis brunnea* sp. n. Male reproductive system. (ac) Lateral accessory gland, (ejc) Ejaculatory duct, (st) Sperm tube, (vd) Vas deferens, (vs) Vesiculae seminales.

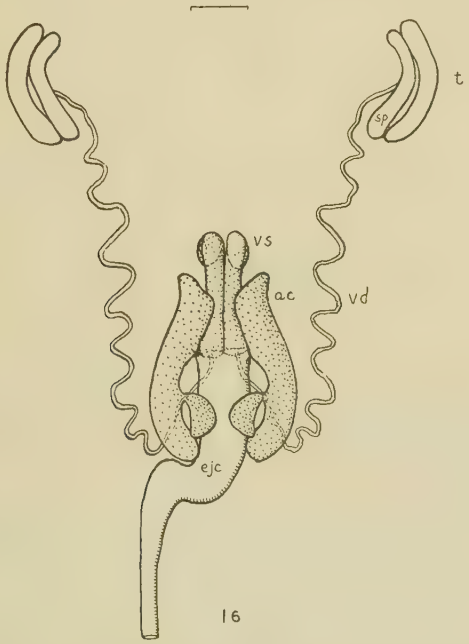
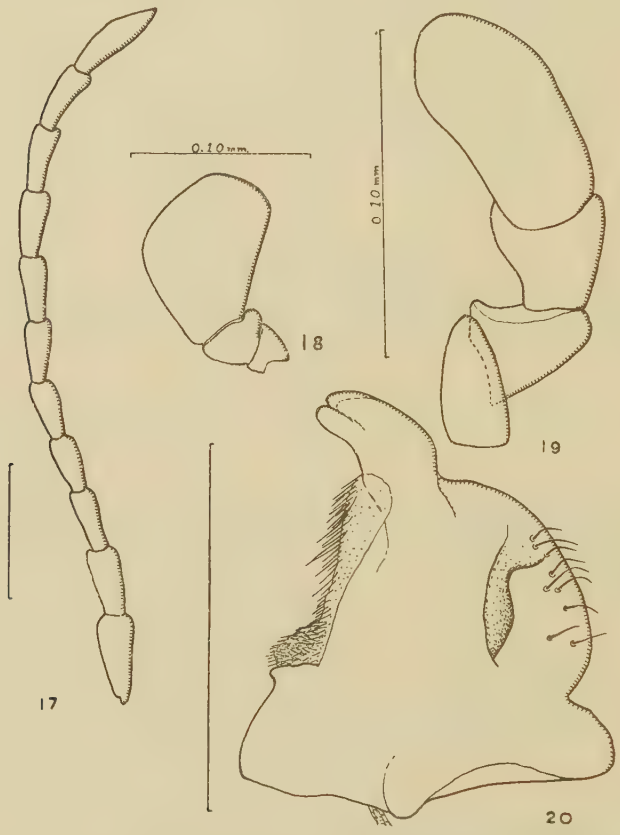


Fig. 16.—*Gyrelmis pusio* sp. n. Male reproductive system. (ac) Lateral accessory gland, (ejc) Ejaculatory duct, (sp) Sperm tube, (t) Testis, (vd) Vas deferens, (vs) Vesicula seminalis.

(1) Male with a long spine on anterior middle of metasternal disk. Homologous part of female flat or with a feeble, obtuse tubercle (*spinata*).
(2) Male with apical middle area of fifth abdominal sternite shallowly depressed (*glabra*, *pusio*).
(3) Male with ventral apex of first segment of front tarsus produced and spinose (*glabra*, *pusio*).



Figs. 17–20.—*Gyrelmis brunnea* sp. n. (17) Antenna, (18) Labial palp, (19) Maxillary palp, (20) Mandible.

A key to the species of *Gyrelmis*.

1. Epipleura without tomentum. Femora and tibiae entirely clothed with tomentum. French Guiana . . . . . *G. glabra* sp. n. p. 388.
–. Epipleura densely tomentose. Femora and tibiae nearly always with glabrous areas . . . . . 2.
2. Prosternal process with posterior margin narrowly produced at middle. Posterior tarsi with fifth segment distinctly shorter than combined length of four basal; all claws very slender and without trace of tooth at base. Male reproductive system with proximal ends of vasa deferentia swollen to form vesiculae seminales. Anterior margin of mid-gut with six caeca . . . . . 3.

–. Prosternal process with posterior margin broadly rounded. Posterior tarsi with fifth segment longer than combined length of four basal ones; all claws stout and feebly toothed at base. Male reproductive system with special tubular pockets serving as vesiculae seminales and proximal ends of vasa deferentia not swollen. Anterior margin of mid-gut with five or six caeca . . . . . 4.

3. Prosternum anteriorly with tomentose area separated from carina by a distance equal to length of third antennal segment; gibbous sides of prosternal process with punctures seldom separated by one diameter and frequently confluent. Male with a long and acute spine on middle anterior sixth of metasternum; genitalia with hairs on apical part of parameres. Brazil (Manaos), French Guiana . . *G. spinata* sp. n. p. 390.

–. Prosternum anteriorly with tomentose area contiguous to or at most separated from carina by a distance equal to half length of third antennal segment; gibbous sides of prosternal process with punctures separated by two to three diameters. Male without a spine on metasternum; genitalia without hairs on parameres. Brazil (Porto Velho, Manaos, Belem), French Guiana . . . . . *G. simplex* sp. n. p. 392.

4. Prosternum with a fine stria on each side contiguous with carina and on process contiguous with thickened sides. Middle of at least basal abdominal sternite with numerous longitudinal strigae. . . . . 5.

–. Prosternum without a fine stria contiguous with carina or thickened side of process. Middle of abdominal sternites usually without longitudinal striae . . . . . 8.

5. Sublateral carina of pronotum extending from base nearly to apex. French Guiana . . . . . *G. obesa* sp. n. p. 393.

–. Sublateral carina of pronotum confined to basal four-fifths or less. . . 6.

6. Sublateral carina of pronotum extending to apical fifth. Brazil (Theresopolis) . . . . . *G. rufomarginata* (Grouv.). p. 395.

–. Sublateral carina of pronotum confined to basal fourth or less. . . . . 7.

7. Pronotum with a complete median longitudinal rufo-piceous band. Antennae bicolorous. French Guiana . . . *G. thoracica* sp. n. p. 397.

–. Pronotum without a median longitudinal paler band. Antennae unicolorous. Brazil (Porto Velho, Manaos, Belem), French Guiana *G. thoracica basalis* subsp. n. p. 398.

8. Species less than 1·5 mm. long. Outer sublateral carina of elytra confined to basal three-fifths. Metasternum with discal carina widely diverging posteriorly. Males with inner apex of first segment of front tarsus produced and spinose. Brazil (Porto Velho, Manaos) *G. pusio* sp. n. p. 398.

–. Species more than 1·5 mm. long. Outer sublateral carina of elytra extending beyond basal three-fifths. Metasternum with discal carina usually nearly parallel. Males with inner apex of first segment of front tarsus not produced and with spines . . . . . 9.

9. Elytra unicolorous. Anterior and ventral side of femora entirely tomentose. Male genitalia with one acute dorso-lateral tubercle on each side of median lobe at basal two-fifths. Brazil (Porto Velho, Belem), French Guiana. . . . . *G. longipes* sp. n. p. 400.

–. Elytra maculate. Anterior and ventral side of femora with tomentum absent on apical third to two-thirds. Male genitalia without tubercles on median lobe. Brazil (Porto Velho) . . . . . 10.

10. Antennae bicolorous. Elytra brownish-yellow and with dark brown vittae . . . . . 11.

––. Antennae unicolorous. Elytra black to rufo-piceous and with brownish-yellow basal and apical patches . . . . . 12.

11. Head with middle area behind fronto-clypeal suture brownish. Pronotum

with two median, feebly diverging black bands. Male with median lobe of genitalia barely projecting beyond parameres. Anterior margin of mid-gut with five or six caeca. Brazil (Manaos, Belem)
G. maculata sp. n. p. 402.

—. Head with middle area behind fronto-clypeal suture black. Pronotum with a single median black band or with all basal three-fourths nearly black. Male genitalia with median lobe projecting distinctly beyond apices of parameres. Anterior margin of mid-gut with five caeca. Brazil (Belem), French Guiana . . . . . *G. brunnea* sp. n. p. 405.

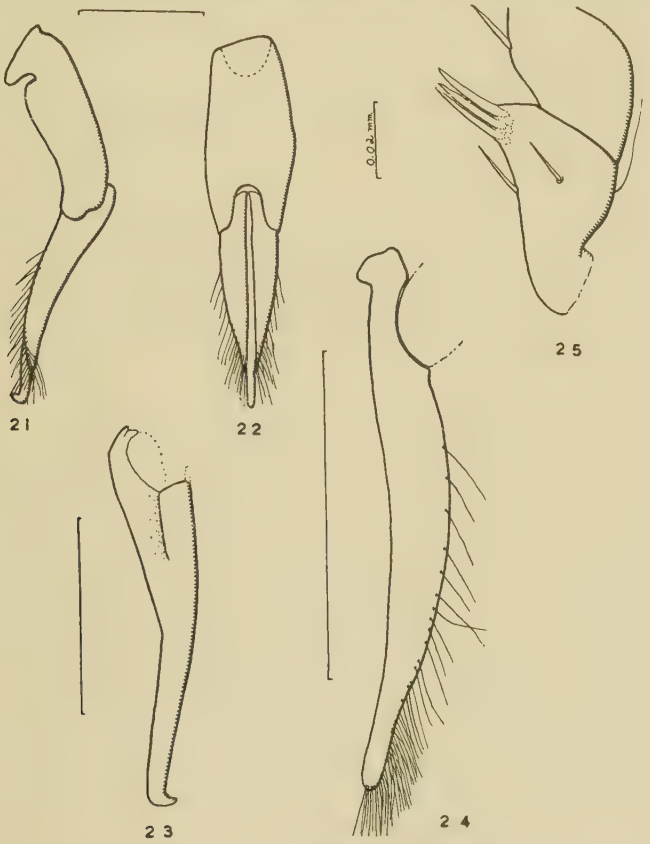
12. Species less than 2·0 mm. long. Pronotum with a complete median longitudinal rufo-piceous band; sublateral carina extending from base to apex and everywhere prominent; broad oval depressions near base separated by more than breadth of scutellum. Elytral striae on basal half of disk broadly and distinctly though shallowly impressed; punctures of third interval coarser than those of first two. Anterior side of front femora with basal fourth tomentose. French Guiana.
G. pulchella sp. n. p. 406.

—. Species more than 2·0 mm. long. Pronotum with at least basal four-fifths entirely black; sublateral carina not extending to apex, obsolete at about apical sixth; oval depressions near base separated by much less than breadth of scutellum. Basal half of elytral disk without distinct striae; punctures of third interval finer than those of first two. Anterior side of hind femora with only a very narrow basal belt of tomentum. Brazil (Porto Velho) . . . . . *G. nubila* sp. n. p. 407.

Gyrelmis glabra sp. n. (figs. 21–25).

Male: Length, 1·4 mm.; breadth, 0·86 mm. Broadly oval, strongly convex. Cuticle shining, moderately pale rufo-piceus; humeri, antennae, mouth-parts, and legs paler to testaceous. *Head* without distinct impressions; surface feebly asperate and with round, very low, flat-topped granules slightly finer than facets of eyes, separated by one to two diameters, and each with a central puncture giving rise to a fine recumbent seta. Clypeus with fronto-clypeal suture well impressed, nearly straight; anterior margin nearly truncate and angle on each side broadly rounded; surface sculptured like head but without distinct granules. Labrum with anterior margin nearly truncate and angle on each side very broadly rounded; basal third very finely, indistinctly punctate; anterior two-thirds with numerous erect, testaceous setae nearly as long as basal antennal segment and arising from punctures a third to a fourth as coarse as facets of eyes and separated usually by two diameters. *Pronotum* across broadest point, which is at base, broader than long (0·71 mm. : 0·46 mm.) and base broader than apex (0·71 mm. : 0·43 mm.). Sides broadly, scarcely noticeably sinuate before hind angles and strongly, narrowly so before apical angles. Pronotal disk evenly convex; impressions at base on each side of scutellum indistinct, shallow, and separated by more than breadth of scutellum. Sublateral carinae extending from base to apex and everywhere prominent. Surface on middle of disk with round punctures half as coarse as facets of eyes or about 0·005 mm. broad and separated by one to five diameters; surface between punctures smooth and polished; towards sides and base of disk punctures become finer and sparser; surface between sublateral carinae and lateral margins finely, densely asperate, particularly at base and sides, and also with numerous irregularly distributed punctures slightly finer than discal. *Elytra* more than twice as long as pronotum (1·09 mm. : 0·46 mm.) and with broadest point at apical two-fifths (0·84 mm.) distinctly broader than broadest point across humeri. Epipleura glabrous. Apices broadly, moderately produced and conjointly, broadly rounded. Sublateral carinae prominent; outer extending to a point opposite middle of second abdominal

sternite. Surface without distinct striae; strial punctures everywhere distinct, about a fifth or sixth as broad as intervals, and separated longitudinally by three to six diameters; strial puctures become distinctly finer towards sides of disk. Intervals flat and surface with microscopic (scarcely visible at × 75) punctures separated by five diameters and each giving rise to a fine, testaceous, recumbent or partly erect seta. *Scutellum* flat, triangular with base and sides rounded, slightly broader than long, and surface punctate like elytral intervals. *Prosternum* with carinae moderately prominent, parallel, and confined to basal two-fifths; prosternal process broadest opposite middle of front coxae and from there



FIGS. 21–25.—*Gyrelmis glabra* sp. n. (21) Left lateral view of male genitalia, (22) Dorsal of same, (23) Right lateral view of median lobe, (24) Dorso-lateral view of paramere, (25) Lateral view of basal segment of front tarsus.

narrowed to apex which is only a fourth as broad and is strongly deflexed downwards (when viewed ventrally); sides broadly, strongly gibbous; with a deep, oval depression occupying all of middle before apex; tomentum extending to anterior sides and nearly to a point opposite carinae; surface with punctures similar but slightly finer than those of pronotal disk and also irregularly alutaceous. Hypomera with basal fifth not tomentose. Metasternum with median longitudinal line distinct, narrow, and extending from base to anterior margin; discal carinae prominent, complete, and moderately diverging posteriorly; surface punctate slightly more coarsely and densely than elytral intervals. Metapleura with anterior third depressed and not tomentose. *Abdomen* with carinae of first sternite

prominent and not quite reaching posterior margin; middle of first sternite feebly rugose and alutaceous, with an occasional fine puncture; middle of other sternites punctate like metasternal disk but slightly more sparsely so. Fifth sternite with an oval, moderately shallow depression on middle apical region. *Legs* with trochanters, femora, and tibiae completely clothed with fine scale-like or hairy tomentum. Tarsi with fifth segment slightly longer than combined length of four basal (hind tarsi, 0·217 mm : 0·180 mm.) segments; front tarsi with ventral apex of first segment produced and spinose (fig. 25); claws stout and with an obtuse tooth at base. *Male genitalia* (figs. 21–24) with basal lobe, when seen from side, deeply and strongly emarginate near ventral apex; median lobe extending beyond apices of parameres and tip sharply curved ventrally; lateral lobes evenly narrowed to apex and outer margins of apical two-thirds setose. *Alimentary canal* with five caeca on anterior margin of mid-gut.

Female : Externally similar to male except as follows: (1) fifth abdominal sternite longer, with more pointed apex, and without apical depression; and (2) basal segment of front tarsus not produced nor spinose.

Type : A male in the collection of the British Museum (Nat. Hist.). French Guiana : St. Laurent du Maroni, x.1937 (*H. E. Hinton*).

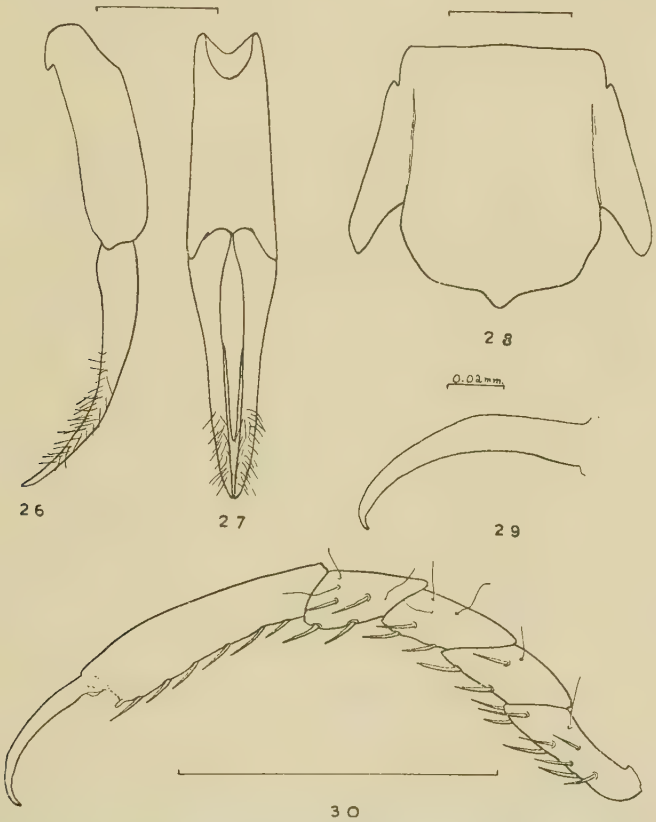
Paratypes : 3 ♂♂ and 1 ♀ with same data as above.

Comparative notes : This may be immediately distinguished from all other species of the genus by its glabrous epipleura. The male genitalia will also serve to distinguish it from any of its congeners.

Gyrelmis spinata sp. n. (figs. 4–7, 26–30).

Male : Length, 1·69 mm.; breadth, 0·98 mm. Broadly oval, strongly convex. Cuticle shining, dark rufo-piceous; antennae, mouth-parts, and legs paler. *Head* broadly, moderately depressed on whole of middle and sides of depression with broad, low carinae moderately converging posteriorly and extending to posterior fourth of head; surface of head irregularly but usually longitudinally rugose and with a few fine punctures about a fourth as coarse as facets of eyes; surface lateral to carinae similarly but less strongly sculptured. Clypeus with fronto-clypeal suture distinct and straight; anterior margin truncate and angle on each side obtusely rounded; surface sculptured like middle of head but more regularly so. Labrum with anterior margin feebly, broadly, and arcuately emarginate; angle on each side broadly rounded; surface densely (one to two diameters), microscopically (just visible at × 75) punctate; anterior three-fourths with numerous suberect to erect golden-testaceous hairs which are about as long as first antennal segment. *Pronotum* across broadest point, which is at about basal third, broader than long (0·80 mm. : 0·60 mm.) and base broader than apex (0·77 mm. : 0·46 mm.). Sides nowhere distinctly sinuate, nearly straight before hind angles. Sublateral carina extending from base to apex and everywhere prominent. Pronotal disk evenly convex; impressions near base at each side of scutellum oval, moderately deep, about two-thirds as broad as scutellum, and separated by a distance equal to breadth of scutellum; middle of disk with round punctures about half to two-thirds as coarse as facets of eyes, separated usually by two to three diameters, and each giving rise to a fine, recumbent hair about four times as long as its respective puncture; surface between these punctures smooth, polished; towards sides and base punctures become finer so that they are only about two-thirds as coarse and are separated by five diameters; surface between sublateral carinae and lateral margins more irregularly and, particularly anteriorly, more coarsely punctate, the punctures being half as coarse again as facets of eyes. *Elytra* twice as long as pronotum (1·23 mm. : 0·60 mm.) and with broadest point, which is at about basal half (0·86 mm.), broader than broadest point across humeri. Epipleura entirely tomentose. Apices broadly, feebly produced

and conjointly, broadly rounded. Sublateral carinae prominent; outer extending to a point opposite basal half of third abdominal sternite. Surface basally without striae, laterally and apically with striae scarcely noticeably impressed; strial punctures on disk distinct, about a third as broad as sutural interval (sutural interval is only half as broad as second), and separated longitudinally by four to five diameters; strial punctures become distinctly finer towards sides and coarser towards apex of disk. Intervals flat; surface with round punctures similar to those of middle pronotal disk; surface between punctures finely and sparsely alutaceous. *Scutellum* flat, triangular with base and sides feebly rounded, broader than long (0·16 mm. : 0·13 mm.); surface punctate like adjacent parts



Figs. 26–30.—*Gyrelmis spinata* sp. n. (26) Left lateral view of male genitalia, (27) Dorsal of same, (28) Ventral view of prosternum, (29) Lateral view of hind claw, (30) Lateral view of tarsus of middle leg.

of elytra but more finely so. *Prosternum* with carinae fine, low, and extending to anterior third (not including process); prosternal process with shape as figured (fig. 28); surface with punctures like those of elytral intervals but everywhere, except on middle region, very dense, often confluent; punctures of middle region separated by two to three diameters; sides of process broadly and strongly gibbous; tomentum on anterior part of prosternum separated from carina by length of third antennal segment. Hypomera entirely tomentose. Metasternum without a median longitudinal line; at middle anterior fifth of disk with a prominent vertical spine which is 0·05 mm. long; discal carinae moderately prominent, complete, and strongly diverging posteriorly so that disk is very broad; surface of disk

punctate as middle of pronotum. Metapleura entirely tomentose. *Abdomen* with carinae of first sternite complete, prominent, and feebly converging inwards posteriorly; middle area of sternites more densely and coarsely punctate than metasternal disk and most of fifth sternite confluently punctate; apical middle of fifth sternite with a large, indistinct, oval, shallow depression. *Legs* with trochanters, all of ventral side of femora and half of anterior side tomentose. Tarsi with fifth segment distinctly shorter than combined length of four basal (fig. 30); claws very narrow and not toothed at base (fig. 29). *Male genitalia* (figs. 26–27) with basal lobe, when seen from side, hooked near ventral apex; median lobe much shorter than parameres; parameres evenly narrowed to apex and apical third setose. *Alimentary canal* (figs. 6–7) with six caeca on anterior margin of mid-gut. *Male reproductive system* (fig. 4) with the proximal ends of the vasa deferentia swollen to serve as vesiculae seminales.

Female: Externally similar to male but at most with only a feeble tubercle in place of metasternal spine.

Type: A male in the collection of the British Museum (Nat. Hist.). French Guiana: St. Laurent du Maroni, x.1937 (*H. E. Hinton*).

Paratypes: 77 males and females with same data as above; and 1, Brazil: Amazonas, Manaos, x.1937 (*H. E. Hinton*).

Variations: Apart from slight variations in the size and density of the punctures on the various sclerites, the following have been noted: (1) in a few males and females there is a very faint but nearly complete median longitudinal line on the metasternum; and (2) a number of females have no trace of the median metasternal tubercle.

Comparative notes: This and the following species constitute a very distinct group in the genus which may later be elevated to subgeneric rank. This group may be distinguished by the following characters: (1) the posterior margin of the prosternal process is narrowly produced at middle instead of being broadly rounded; (2) the tarsi have the last segment distinctly shorter than combined length of four basal segments; (3) all claws are very slender and have no trace of a tooth at base; and (4) the male reproductive system has the proximal ends of the vasa deferentia swollen to form vesiculae seminales, instead of having special tubular pockets to store the sperm.

Gyrelmis simplex sp. n. (figs 31–34, 60).

Male: Length, 1·69 mm.–2·10 mm.; breadth, 1·06 mm.–1·15 mm. Broadly oval, strongly convex. Cuticle shining, dark rufo-piceous; antennae, mouth-parts, and legs paler. Externally similar to *G. spinata* except in the following particulars: (1) the outer sublateral carina of the elytra is not so long, extending only to a point opposite middle of second abdominal sternite; (2) the prosternal tomentum is contiguous to or at most separated from carina by a distance equal to half length of third antennal segment; (3) prosternal carinae are very distinctly continued posteriorly on gibbous side of process to posterior margin, while in *G. spinata* it is indistinct; (4) gibbous sides of process with punctures separated usually by two to four diameters, whereas in *G. spinata* they are seldom separated by one diameter and are frequently confluent; (5) male has no trace of a median metasternal spine; and (6) femora have basal two-thirds instead of only basal half tomentose.

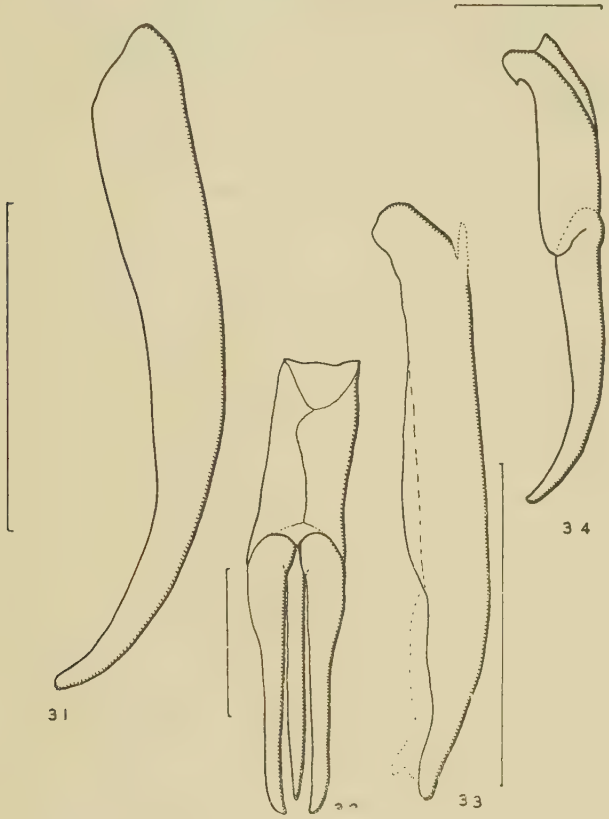
Female: Externally similar to male.

Type: A male in the collection of the British Museum (Nat. Hist.). Brazil: Amazonas, Manaos, ix.1937 (*H. E. Hinton*).

Paratypes: 35, with same data as above; 10, Brazil: Matto Grosso, Porto Velho, viii.–ix.1937 (*H. E. Hinton*); 28, Brazil: Pará, Belem, ix.1937

(*H. E. Hinton*); and 166, French Guiana: St. Laurent du Maroni, x.1937 (*H. E. Hinton*).

Comparative notes: As stated above under the description of *G. spinata*,



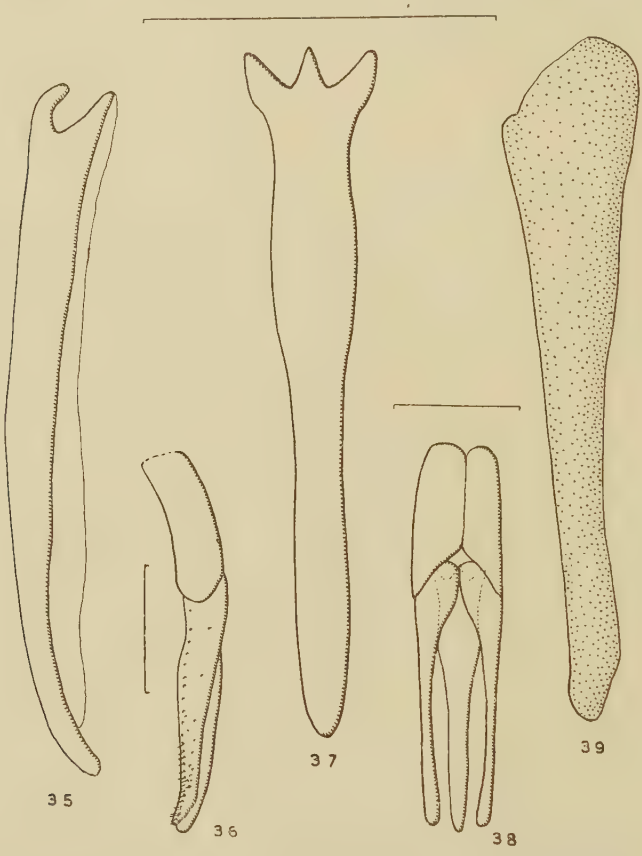
Figs. 31–34.—*Gyrelmis simplex* sp. n. (31) Lateral view of paramere, (32) Dorsal view of male genitalia, (33) Lateral view of median lobe of same, (34) Left lateral view of male genitalia.

this belongs with that species in a very distinct group of the genus. Aside from the differences already mentioned, the two species may be separated at once by the structures of the male genitalia (*cf.* figs.).

Gyrelmis obesa sp. n. (figs. 35–39).

Male: Length, 2·13 mm.; breadth, 1·06 mm. Obovate, strongly convex. Cuticle shining, black to rufo-piceous; antennae, mouth-parts, and legs paler rufo-piceous to rufo-testaceous. *Head* with a broad, shallow, indefinite impression on each side near middle of eye and on each side opposite anterior fifth of eye with a broad, low ridge extending inwards and posteriorly to posterior fourth of head; surface posteriorly and at sides of ridges densely asperate; surface on middle region irregularly rugose, with punctures about one-fourth as coarse as facets of eyes, usually separated by less than two diameters, and with a few flat-topped, round tubercles not quite as coarse as facets of eyes and having a microscopic puncture on centre. Clypeus with fronto-clypeal suture straight and

distinct; anterior margin truncate, with angle on each side obtusely rounded; surface sculptured as head but not rugose and with punctures and tubercles finer. Labrum with anterior margin feebly and broadly rounded; angle on each side broadly rounded; surface with punctures about a third as coarse as facets of eyes and usually separated by two or three diameters. *Pronotum* across broadest point, which is at basal third, broader than long (0·87 mm. : 0·68 mm.) and base broader than apex (0·82 mm. : 0·52 mm.). Sides scarcely noticeably sinuate before hind angles. Sublateral carinae extending from base to apex and distinctly more prominent on apical three-fifths than basal two-fifths. Pronotal



Figs. 35–39.—*Gyrelmis obesa* sp. n. (35) Right lateral view of median lobe of male genitalia, (36) Left lateral view of male genitalia, (37) Dorsal view of median lobe, (38) Dorsal view of male genitalia, (39) Dorso-lateral view of paramere.

disk evenly convex; impressions near base on each side of scutellum oval, moderately deep, about a third as broad as scutellum, and separated by a distance equal to slightly less than breadth of scutellum. Middle of disk with round punctures about two-thirds as coarse as facets of eyes, separated usually by two diameters, and each giving rise to a fine, recumbent seta about three to four times as long as its respective puncture; surface between punctures usually smooth and polished; towards sides and base punctures become finer and sparser; towards apex sparser and surface between is very faintly, densely asperate; surface between sublateral carinae and lateral margins on basal three-fifths with a few fine punctures but on apical two-fifths also with punctures half again as coarse as facets of eye

and often confluent so that surface appears rugose. *Elytra* more than twice as long as pronotum (1·47 mm. : 0·68 mm.) and with broadest point, at about middle (1·06 mm.), slightly broader than broadest point across humeri. Epipleura entirely tomentose. Apices scarcely produced, conjointly and feebly rounded. Sublateral carinae prominent, outer slightly more prominent than inner on basal half and extending to a point opposite basal half of third abdominal sternite. Surface everywhere with shallow, broad striae which become deeper towards apex; strial punctures on disk round, deep, a fourth to a third as broad as intervals, and separated longitudinally by one to two diameters; punctures on second and third striae on basal fifth much finer and sparser. Intervals on disk feebly convex, particularly apical surface with punctures as fine as those of base of pronotum and usually separated by five to ten diameters; surface between punctures feebly and indistinctly punctate. *Scutellum* flat, triangular with base and sides rounded, and slightly broader than long (0·16 mm. : 0·14 mm.); surface sculptured as adjacent elytral intervals. *Prosternum* with carinae fine, moderately prominent, feebly converging, and extending nearly to apex as well as nearly to posterior margin of process; carinae on inner side with a fine, distinct stria; prosternal process with broadest point at basal third and posterior margin broadly rounded; surface with punctures like those of elytral intervals except anteriorly where they are denser; tomentum on anterior half extending nearly to carina. Hypomera tomentose except on a narrow posterior belt mostly confined to ventral part. Metasternum with a fine median longitudinal line extending to anterior fourth; discal carinae prominent, complete, and only feebly diverging posteriorly; surface of disk punctate like sides of pronotal disk; surface between punctures indistinctly but densely asperate. Metapleura entirely tomentose and with an oval, moderately deep depression at anterior margin. Abdomen with carinae of first sternite moderately prominent, nearly complete, and feebly converging posteriorly; middle area of sternites with numerous broad, close, longitudinal strigae, densely asperate, and with a few fine punctures; fifth abdominal sternite without distinct strigae. *Legs* with trochanters and all of ventral, anterior, and basal two-thirds of dorsal side of femora tomentose. Tarsi with fifth segment distinctly longer than combined length of four basal; claws broad and each with a feebly developed basal tooth. *Male genitalia* (figs. 35–39) with parameres narrowed to and feebly broadened near apex and with numerous very fine setae; median lobe (fig. 37) extending slightly beyond apices of parameres and nearly evenly narrowed to apex. *Alimentary canal* with six caeca on anterior margin of mid-gut. *Male reproductive system* with special tubular pockets to store sperm.

Female : Externally similar to male.

Type : A male in the collection of the British Museum (Nat. Hist.). French Guiana : St. Laurent du Maroni, x.1937 (*H. E. Hinton*).

Paratypes : 26, with same data as above.

Variations : A few specimens have the sublateral carinae completely absent on basal third except for a very short distance in front of base.

Comparative notes : This may be distinguished from all other known species by the fact that the sublateral carinae are distinctly more prominent on apical than basal half. The male genitalia are unlike those of any other species.

Gyrelmis rufomarginata (Grouv.).

Helmis rufomarginata Grouvelle, 1888, *Ann. Soc. ent. Fr.* **8** : 405, t. 8, f. 5.
Heterelmis rufomarginata Hinton, 1936, *Entomologist* **69** : 288.

A single female paratype of this species (Brazil : Theresopolis) in the collection of the British Museum has been examined, and a re-description is as follows :—

Female : Length, 2·32 mm.; breadth, 1·17 mm. Obovate, strongly convex. Cuticle

shining, black to rufo-piceous; anterior middle region of pronotum, basal fifth of elytra and apical half of third to seventh intervals of elytra reddish; antennae, mouth-parts, and legs paler rufo-piceous. *Head* without distinct impressions; surface of middle region with punctures about half as coarse as facets of eyes and separated by three to five diameters; surface between punctures very slightly, indistinctly, densely punctate. Shape of clypeus and labrum like *G. obesa*. *Pronotum* across broadest point, which is at basal third, broader than long (0·87 mm. : 0·73 mm.) and base broader than apex (0·84 mm. : 0·57 mm.). Sides nowhere distinctly sinuate. Sublateral carinae extending from base to about apical fifth, with a narrow but complete interruption at basal two-fifths, moderately prominent on basal third and beyond this rather indistinct. Pronotal disk evenly convex; impression near base at each side of scutellum moderately deep, oval, about two-thirds as broad as scutellum, and separated by a distance equal to about two-thirds of scutellum. Middle of disk with round punctures about two-thirds as coarse as facets of eyes and separated usually by one to two diameters; surface between these punctures smooth; towards apex and base punctures become finer, while on apical half at sides outer to sublateral carinae they are coarser, denser, and interspersed with much finer punctures. *Elytra* more than twice as long as pronotum (1·97 mm. : 0·73 mm.) and with broadest point, which is at about apical two-fifths (1·06 mm.), distinctly broader than broadest point across humeri. Epipleura entirely tomentose. Sublateral carinae prominent; outer slightly more prominent than inner and extending to a point opposite posterior margin of third abdominal sternite. Disk basally with striae very shallow, lateral striae scarcely noticeable but apically with all striae broad and shallow; strial punctures a third to a fifth as broad as intervals (sutural interval is only two-thirds as broad as second), round, and separated longitudinally by less than to one diameter; punctures distinctly coarser and denser in sutural stria. Intervals flat, apically very feebly convex, and punctate like base of pronotum. *Scutellum* flat, triangular with base and sides rounded, and slightly longer than broad (0·15 mm. : 0·13 mm.); surface punctate similarly but more finely than adjacent elytral intervals. *Prosternum* with carinae fine, moderately prominent, feebly converging anteriorly, present on basal half (not including process), extending nearly to posterior margin of process, and inner side of each with a fine but distinct stria; process with broadest point at basal third and posterior margin broadly rounded; surface of prosternum with punctures like those of pronotal disk and, particularly near anterior margin, with a number of fine, longitudinal strigae; tomentum on anterior half separated from level of carina by a distance equal to two-thirds length of third antennal segment. Hypomera entirely tomentose. Metasternum with a fine median longitudinal line extending to anterior fifth; discal carinae prominent, nearly complete, and feebly diverging posteriorly; surface of disk with punctures as coarse as those of elytral intervals and usually separated by one to five diameters; surface between punctures very finely but distinctly, densely asperate. Metapleura entirely tomentose and with a deep, oval impression near anterior margin. *Abdomen* with carinae of first sternite moderately prominent, feebly converging posteriorly, and present on basal two-thirds; middle area of first three sternites with numerous longitudinal strigae; surface of all sternites with fine punctures similar to those of metasternal disk and between punctures finely and densely asperate. *Legs* with trochanters, most of ventral side, basal third of anterior side (basal two-thirds of anterior side of front pair), and basal third of dorsal side of femora tomentose. Tarsi with fifth segment longer than combined length of four basal; claws broad and each with a feebly developed basal tooth.

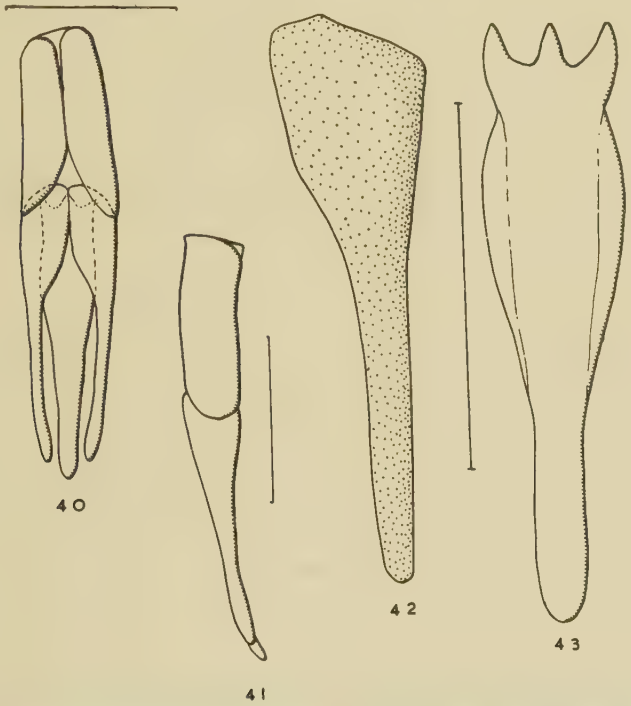
Comparative notes : Of those species already described, this is most closely related to *G. obesa*. From the latter it may be distinguished by its incomplete sublateral pronotal carinae and maculate instead of unicolorous elytra.

Gyrelmis thoracica sp. n.

Male : Length, 1·69 mm.–2·29 mm.; breadth, 0·87 mm.–1·10 mm. Externally similar to *G. rufomarginata* (Grouv.) but differs in the following particulars: (1) the sublateral pronotal carinae are present on basal seventh to basal fifth and there is rarely a short, indistinct carina on apical fourth, whereas in *rufomarginata* the carinae extend to basal fifth and are narrowly interrupted at basal two-fifths; (2) the antennae are bicoloured instead of uniformly pale rufo-piceous; and (3) the pronotum has a median longitudinal rufo-piceous band which is completely absent in *rufomarginata*. *Male genitalia* similar to those figured for *G. thoracica basalis* subsp. n. (figs. 40–43). *Alimentary canal* with five caeca on anterior margin of mid-gut.

Female : Externally similar to male.

Type : A male in the collection of the British Museum (Nat. Hist.). French Guiana : St. Laurent du Maroni, x.1937 (*H. E. Hinton*).



Figs. 40–43.—*Gyrelmis thoracica basalis* subsp. n. (40) Dorsal view of male genitalia, (41) Right lateral view of same, (42) Dorso-lateral view of paramere, (43) Dorsal view of median lobe dissected out.

Paratypes : 800, with same data as above.

Variations : In one specimen the sublateral pronotal carinae are completely absent. The anterior half of the pronotum at sides is nearly as sparsely punctate as sides of disk, but in some specimens the punctures are here slightly coarser and frequently confluent. In a few specimens there is a very faint but dense asperate microsculpture between pronotal punctures. About a third of the specimens have the first two antennal segments a very dark brown and others nearly black, though apical third of segments three to ten and apical half

of eleven is always slightly paler. In a few specimens the antennae are nearly uniformly brownish-testaceous. Most individuals have the greater part of the apical half of the tibiae slightly darker than basal or extreme apical part.

Gyrelmis thoracica basalis subsp. n. (figs. 40–43).

Male : Externally and internally similar to *G. thoracica thoracica* but with the antennae always uniformly coloured and the pronotum without a median longitudinal rufo-piceous band. *Male genitalia* as figured (figs. 40–43) with median lobe evenly narrowed to apex and extending distinctly beyond apex; parameres evenly narrowed to apex.

Female : Externally similar to male.

Type : A male in the collection of the British Museum (Nat. Hist.). Brazil : Amazonas, Manaos, ix.1937 (*H. E. Hinton*).

Paratypes : 22, with same data as above; 1, Brazil : Matto Grosso, Porto Velho, viii.–ix.1937 (*H. E. Hinton*); 12, Brazil : Pará, Belem, ix.1937 (*H. E. Hinton*); and 249, French Guiana : St. Laurent du Maroni, x.1937 (*H. E. Hinton*).

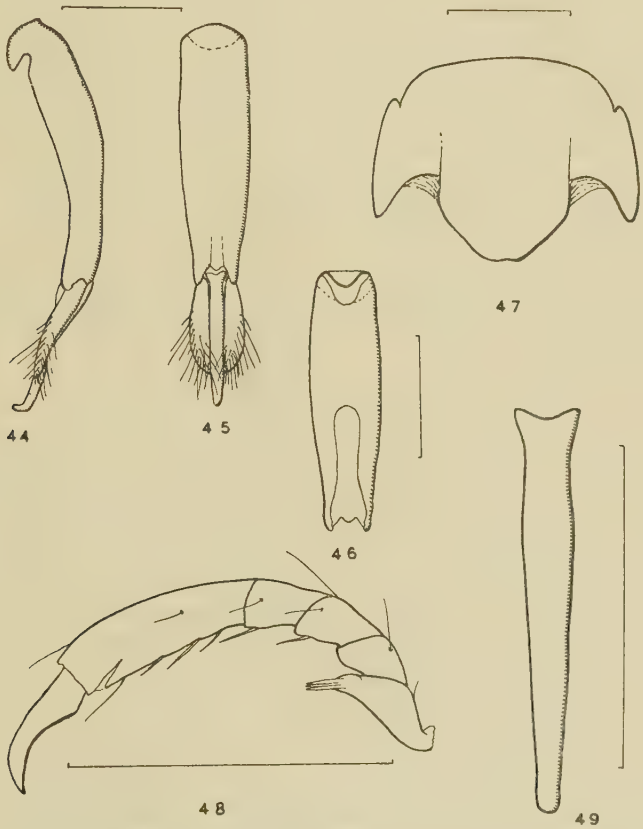
Variations : The darker parts of the elytra and pronotum are rufo-piceous in the Brazilian examples, while in all but a few of the specimens from French Guiana they are black.

Comparative notes : This is apparently more nearly related to *G. rufomarginata* than is *G. thoracica thoracica*. From *G. rufomarginata* it may be distinguished by having the sublateral carinae of the pronotum confined to basal fourth or less instead of extending to apical fifth.

Gyrelmis pusio sp. n. (figs. 16, 44–49).

Male : Length, 1·42 mm.; breadth, 0·82 mm. Broadly oval, strongly convex. Cuticle shining, brownish to rufo-piceous with apical four-fifths of elytra at sides and apical half at middle darker; antennae, mouth-parts, and legs paler, nearly testaceous. *Head* without distinct impressions; surface of middle region microscopically, very densely asperate. Clypeus with fronto-clypeal suture distinct and so formed that anterior margin of head is feebly, broadly, arcuate, or nearly straight; anterior margin nearly truncate and angle on each side obtusely rounded; surface asperate like head but slightly less distinctly so. Labrum with anterior margin feebly rounded and angle on each side broadly rounded; surface with round punctures half to two-thirds as coarse as facets of eyes and separated by one to two diameters, each puncture giving rise to a suberect, golden-testaceous hair nearly as long as apical antennal segment. *Pronotum* across broadest point, which is at base (at basal third very nearly as broad as at base), broader than long (0·63 mm. : 0·49 mm.) and base broader than apex (0·63 mm. : 0·42 mm.). Sides broadly, feebly sinuate before hind and apical angles. Sublateral carinae extending from base to apex and everywhere prominent. Pronotal disk evenly convex; impressions near base on each side of scutellum moderately deep, oval, half to two-thirds as broad as scutellum, and separated by less than breadth of scutellum. Surface of middle disk with two types of punctures as follows : (1) large punctures two-thirds as coarse as facets of eyes and separated by one to two diameters; and (2) microscopic punctures about half as coarse and very irregularly distributed; towards base coarse punctures become sparser. Sides between sublateral carinae and lateral margins with coarse punctures sparser and fine punctures more regular and much denser so that surface is densely but lightly asperate. *Elytra* twice as long as pronotum (1·01 mm. : 0·49 mm.) and with broadest point, which is at about apical two-fifths (0·82 mm.), distinctly broader than broadest point across humeri. Epipleura entirely tomentose but near anterior margin with tomentum very sparse. Apices feebly produced

and broadly, conjointly rounded. Sublateral carinae prominent, outer less prominent than inner and not quite extending to a point opposite posterior margin of second abdominal sternite. Surface with sutural stria very shallow and other striae indistinct; strial punctures round, a fifth to a third as coarse as intervals, and separated longitudinally by two to five diameters; punctures of sutural stria slightly coarser than those of other discal striae. Intervals flat; surface with microscopic punctures separated by five diameters and each giving rise to a fine, testaceous, recumbent seta. *Scutellum* flat, triangular with base and sides rounded, about as broad as long; surface punctate more finely than ad-



FIGS. 44–49.—*Gyrelmis pusio* sp. n. (44) Left lateral view of male genitalia, (45) Dorsal view of same, (46) Ventral view of basal lobe, (47) Ventral view of prosternum, (48) Lateral view of left front tarsus, (49) Dorsal view of median lobe of male genitalia.

jacent elytral intervals and surface between punctures more polished. *Prosternum* shaped as figured (fig. 47); with the carinae fine, feebly diverging anteriorly, and confined to basal half (not including process); process with sides and posterior margin broadly and strongly gibbous; tomentum confined to a narrow belt on anterior three-fourths adjacent to sternonotal suture; surface sculptured similarly to sides of pronotum between sublateral carinae and lateral margins. Hypomera with a short, non-tomentose posterior belt on ventrolateral part. Metasternum with median longitudinal line extending to anterior fifth, on posterior two-thirds moderately deep and broad but anteriorly narrower and more shallow; carinae prominent, complete, and widely diverging posteriorly; surface punctate like

pronotal disk but with coarse punctures sparser. Metapleura with a broad, oval, non-tomentose depression on anterior third. *Abdomen* with carinae of first sternite prominent, nearly complete, and feebly diverging posteriorly; surface of middle sternites densely, very finely asperate and with a few sparse punctures; middle of fourth sternite not distinctly asperate on posterior half. Fifth sternite with a median oval depression near apical margin. *Legs* with trochanters, femora, and tibiae entirely tomentose. Tarsi with fifth segment longer than combined length of four basal; front tarsi with ventral apex of first segment produced and spinose (fig. 48); claws stout and with an obtuse tooth at base. *Male genitalia* (figs. 44–46, 49) with basal lobe, when seen from side, deeply and strongly emarginate near ventral apex; median lobe extending considerably beyond apices of parameres, evenly narrowed to apex, and with tip strongly bent ventrally; lateral lobes broadly dilated and hairy apically. *Alimentary canal* with five caeca on anterior margin of mid-gut Male reproductive system (fig. 16) with special tubular vesiculae seminales.

Female : Externally similar to male but without a depression on apex of fifth abdominal sternite and with ventral apex of first segment of front tarsus not produced nor spinose.

Type : A male in the collection of the British Museum (Nat. Hist.). Brazil : Matto Grosso, Porto Velho, viii.–ix.1937 (*H. E. Hinton*).

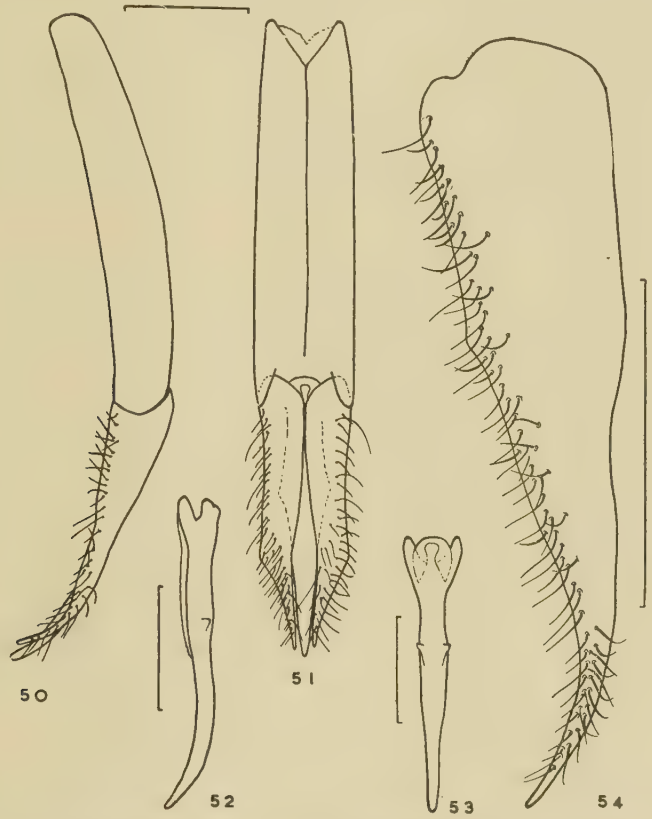
Paratypes : 15, with same data as above; and 1, Brazil : Amazonas, Manaos, ix.1937 (*H. E. Hinton*).

Comparative notes : This species closely resembles *G. glabra* but may be distinguished by the tomentose instead of glabrous epipleura and the structures of the male genitalia.

Gyrelmis longipes sp. n. (figs. 8–10, 50–54).

Male : Length, 2·38 mm.; breadth, 1·20 mm. Obovate, strongly convex. Cuticle shining, rufo-piceous to black; antennae, mouth-parts, and legs paler rufo-piceous. *Head* without distinct impressions; middle region with numerous round granules about as coarse as facets of eyes, separated by one to two diameters, and each with a minute apical puncture from which arises a fine, partly recumbent seta; surface between granules with irregularly distributed though usually dense microscopic punctures; surface on posterior fourth and on genae without granules, very finely asperate or transversely alutaceous. Clypeus with fronto-clypeal suture well impressed, nearly straight; anterior margin truncate and angle on each side obtusely rounded; surface sculptured like middle region of head but with granules slightly finer, much less distinct, and denser. Labrum with anterior margin nearly truncate and angle on each side broadly rounded; surface with punctures about a third to half as coarse as facets of eyes, generally separated by two diameters, and at sides on anterior half giving rise to long, partly erect, golden-testaceous setae. *Pronotum* across broadest point, which is at base (base is as broad as basal third), broader than long (0·93 mm. : 0·82 mm.) and base broader than apex (0·93 mm. : 0·57 mm.). Sides nowhere distinctly sinuate. Sublateral carinae everywhere prominent, sharp, and extending from base to apex. Pronotal disk evenly convex; impression near base at each side of scutellum moderately shallow, oval, about a third as broad as scutellum, and separated by slightly less than breadth of scutellum. Surface on middle of disk with round, deep punctures about as coarse as facets of eyes, separated by one and a half to two diameters, and each giving rise to a fine, recumbent seta; towards apex, sides, and base these punctures become finer and sparser; surface between sublateral carinae and lateral margins with fine, sparse punctures on basal two-fifths but on apical three-fifths with punctures often coarser than those of mid-pronotal disk, frequently confluent, and occasionally with an indistinct granule. *Elytra* twice as long as pronotum (1·64 mm. : 0·82 mm.) and with broadest point, which is at apical two-fifths (1·20 mm.), distinctly broader than greatest breadth across humeri. Epipleura densely tomentose except for a belt at anterior margin

which is about as long as second antennal segment. Apices moderately produced and broadly, conjointly rounded. Sublateral carinae equally prominent and outer extending to a point opposite posterior margin of third abdominal sternite. Disk with only first two striae distinct but shallow; strial punctures round, moderately deep, a third to a fifth as broad as intervals, and separated longitudinally by one to two diameters; strial punctures become slightly finer and sparser in outer discal striae. Intervals flat and surface with punctures as fine as those of basal pronotal disk and separated by five to ten diameters. *Scutellum* flat, triangular with base and sides feebly rounded, and broader than long



FIGS. 50–54.—*Gyrelmis longipes* sp. n. (50) Left lateral view of male genitalia, (51) Dorsal view of same, (52) Lateral view of median lobe, (53) Dorsal view of same, (54) Dorso-lateral view of paramere.

(0·16 mm. : 0·13 mm.); surface punctate as adjacent elytral intervals. *Prosternum* with carinae prominent, fine, present on basal two-thirds (not including process), and nearly parallel; prosternal process with broadest point at basal third, posterior margin nearly truncate, sides and posterior margin strongly gibbous, and broadly, deeply depressed near apex; tomentum anteriorly separated from carinae by about half length of second antennal segment; surface punctate as sides of pronotal disk and also feebly rugose. Hypomera entirely tomentose except for a narrow belt at posterior margin. Metasternum with median longitudinal line moderately narrow, deep, and extending to anterior fourth; discal carinae prominent, nearly complete, and feebly diverging posteriorly; surface punctate like elytral intervals but posteriorly at sides with a few coarser, denser punctures; surface with

punctures smooth and polished; with a broad, oval, shallow depression at angle of posterior margin and discal carina. Metapleura entirely tomentose and with a broad, oval depression at anterior margin. *Abdomen* with carinae of first sternite prominent, nearly complete, and feebly converging posteriorly; middle of first sternite with round to oval punctures about half again as coarse as facets of eyes, often longitudinally confluent, and seldom separated by more than one diameter; surface between these punctures scarcely noticeably asperate and also with a few microscopic punctures. Second sternite similarly but more finely punctate and sternites three to five punctate like metasternal disk and only occasionally asperate; fifth sternite feebly gibbous across middle. *Legs* unusually (for this genus) long; trochanters and femora except apical dorsal side tomentose. Tarsi with fifth segment slightly longer than combined length of four basal; claws stout and with a very feebly developed tooth at base. *Male genitalia* (figs. 50–54) with median lobe extending slightly beyond apices of parameres, more or less evenly narrowed to apex, and at basal two-fifths (fig. 53) with an obtuse dorsal tooth on each side; parameres dilated, though at apical fourth suddenly narrowed to apex and with numerous long, fine hairs. *Alimentary canal* with six caeca on anterior margin of mid-gut. *Male reproductive system* (fig. 8) with special tubular pockets for storing sperm.

Female : Externally similar to male.

Type : A male in the collection of the British Museum (Nat. Hist.). Brazil : Pará, Belem, ix.1937 (*H. E. Hinton*).

Paratypes : 62, with same data as above; 1, Brazil : Matto Grosso, Porto Velho, viii.–ix.1937 (*H. E. Hinton*); and 1, French Guiana : St. Laurent du Maroni, x.1937 (*H. E. Hinton*).

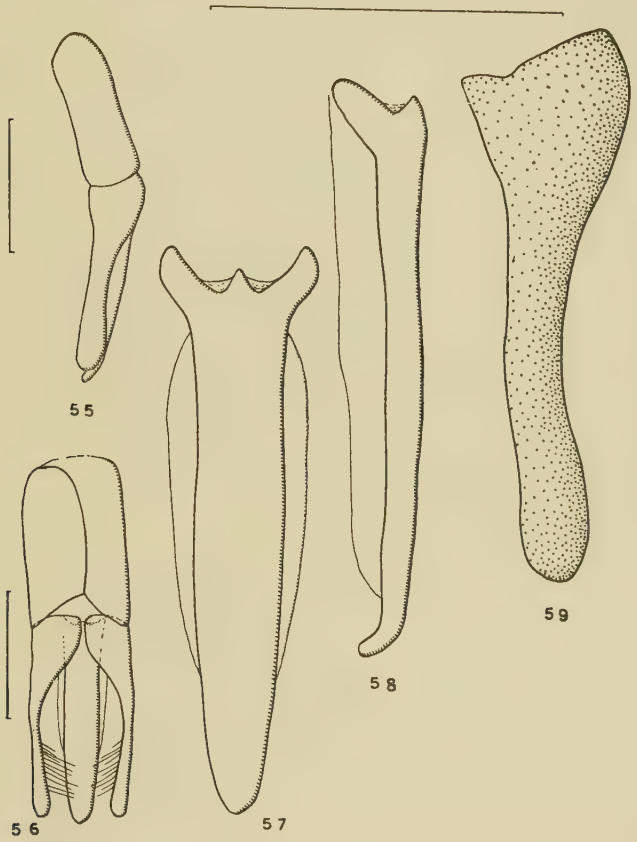
Variations : The size and density of the punctures on the various sclerites show a slight degree of variation, this variation being most evident on the middle area of the abdominal sternites. In the most sparsely punctate specimen before me, a female, the punctures on the first abdominal sternite are about as coarse as facets of eyes and, at least on posterior three-fifths, usually separated by two or more diameters, while the punctures of the second sternite are no coarser or denser than those of third or fourth sternites.

Comparative notes : This species is not closely related to any other in the genus, a conclusion supported by a study of the male genitalia which is unique in possessing a dorsal well-developed tubercle on each side of the median lobe.

Gyrelmis maculata sp. n. (figs. 11, 55–59).

Male : Length, 2·10 mm.–2·32 mm.; breadth, 0·95 mm.–1·04 mm. Obovate, moderately convex. Cuticle shining, brownish-testaceous; darker brown to black areas as follows : all of head except a middle triangular region; antennal segments three to eleven; two median, feebly diverging anteriorly, broad bands on basal three-fifths of pronotum; lateral margins and to a lesser extent sublateral carinae of pronotum; and apical half of sutural interval, middle of third, and most of middle region of fifth and sixth. *Head* without distinct impressions; surface on middle region densely asperate throughout and with an occasional fine puncture. Clypeus with fronto-clypeal suture well impressed, nearly straight; anterior margin truncate, angle on each side obtusely rounded; surface only occasionally asperate and with round punctures two-thirds as coarse as facets of eyes and separated by two to three diameters. Labrum with anterior margin nearly truncate and angle on each side broadly rounded; posterior third nearly smooth, anterior third with punctures similar to those of clypeus but slightly denser; each puncture here, as elsewhere, gives rise to a fine seta and surface between punctures not asperate. *Pronotum* across broadest point, which is at basal two-fifths, broader than long (0·79 mm. : 0·65 mm.) and base broader than apex (0·76 mm. : 0·52 mm.). Sides broadly and scarcely noticeably

sinuate before hind angles. Sublateral carinae prominent, extending from base to apical eighth. Pronotal disk evenly convex; impressions near base on each side of scutellum shallow, oval, about a third as broad as scutellum, and separated by a distance equal to breadth of scutellum; punctures of middle disk round, slightly finer than facets of eyes, each gives rise to a fine, recumbent hair about three times length of its respective puncture, and separated by two to three diameters; surface between punctures very lightly though densely asperate; punctures become finer and sparser towards apex, base, and sides;



FIGS. 55–59.—*Gyrelmis maculata* sp. n. (55) Left lateral view of male genitalia, (56) Dorsal view of same, (57) Dorsal view of median lobe, (58) Left lateral view of same, (59) Dorso-lateral view of paramere.

sides between sublatera carinae and lateral margins with the punctures (particularly anteriorly) coarser, denser, often confluent, and mostly confined to lateral part. *Elytra* more than twice as long as pronotum (1·42 mm. : 0·65 mm.) and with broadest point, which is about at apical two-fifths (1·04 mm.), slightly broader than broadest point across humeri. Epipleura entirely tomentose except for extreme anterior margin. Apices broadly, feebly produced and conjointly, broadly rounded. Sublateral carinae prominent, inner slightly less so than outer, and outer extending to a point opposite anterior fourth of third abdominal sternite. Disk with sutural stria feebly impressed, other striae only very feebly impressed

apically; strial punctures round, a fourth to an eighth (second interval nearly twice breadth of first) as broad as intervals, and separated longitudinally usually by one to two diameters; strial punctures become finer laterally and much finer on basal third. Intervals flat and surface with punctures about half as coarse as those of pronotal disk and usually separated by four to six diameters; each puncture gives rise to a fine, partly recumbent seta about five times its own length; surface betwen punctures very sparsely alutaceous. *Scutellum* flat, triangular with base and sides feebly rounded, and broader than long (0·16 mm. : 0·13 mm.); surface with a few microscopic punctures. *Prosternum* with carinae prominent, confined to basal fourth or third (not including process), and feebly diverging anteriorly; prosternal process broadest at base, posterior margin feebly rounded, and sides strongly gibbous with inner sides sharp; tomentum anteriorly extending to a point opposite end of carina; surface with similar but slightly coarser punctures than elytral intervals and surface between punctures densely asperate except on anterior half where it is often smooth. Hypomera with a narrow, ventro-posterior part smooth. Metasternum with median longitudinal line fine, shallow, and extending to anterior third; discal carinae prominent, complete, and nearly parallel; surface with punctures like elytral intervals and separated by 10 diameters; surface between punctures lightly asperate. Metapleura tomentose except for extreme anterior margin. *Abdomen* with carinae of first sternite prominent and extending to anterior fourth; middle of sternites densely asperate and punctate like metasternal disk; anterior middle part of first sternite with about seven feeble longitudinal strigae. *Legs* with trochanters and basal third to fourth of femora tomentose. Tarsi with fifth segment slightly longer than combined length of four basal ones; claws stout and with an obtuse basal tooth. *Male genitalia* (figs. 55–59) with median lobe extending slightly beyond apices of parameres, evenly narrowed to apex, and apex strongly curved ventrally; parameres broadened near apex and with numerous hairs on apical region. *Alimentary canal* with five or six caeca on anterior margin of mid-gut. Male reproductive system (fig. 11) with special tubular vesiculae seminales.

Female : Externally similar to male.

Type : A male in the collection of the British Museum (Nat. Hist.). Brazil : Pará, 55 km. from Belem on Estrada de Ferro de Bragança, ix.1937 (*H. E. Hinton*).

Paratypes : 61, with same data as above; and 70, Brazil : Amazonas, Manaos, ix.1937 (*H. E. Hinton*).

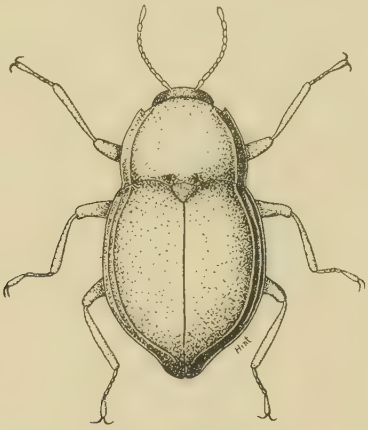
Variations : The extent of the black markings on the pronotum varies considerably. In some only the two median black bands are present and these are confined to basal third, while in others the two black bands extend to apical fourth, and the entire region between sublateral carinae and lateral margins is very dark brown to nearly black. The surface between the punctures of the pronotal disk is sometimes densely though very lightly asperate, while in some specimens no trace of this microsculpture can be seen here. The asperate microsculpture between the punctures of the metasternal disk and that of the abdominal sternites is usually dense and distinct, but in some specimens is only distinct on middle of metasternal disk and is only occasionally present on abdominal sternites.

The most remarkable variation is that in the number of caeca on the anterior margin of the mid-gut. Four of the nine specimens examined for this character had six caeca and the others only five.

Comparative notes : The maculation of the dorsal surface and the structures of the male genitalia will serve to distinguish this from those species already described.

Gyrelmis brunnea sp. n. (figs. 1–3, 15, 17–20, 61–68).

Male : Length, 2·38 mm.; breadth, 1·14 mm. Obovate, moderately convex. Similar to *G. maculata* but differs in the following particulars : (1) middle region of head behind fronto-clypeal suture always entirely black instead of pale or dark brown as in *maculata*; (2) pronotum with a single, median, broad, black band present on basal three-fourths, while n *maculata* there are two median, slightly diverging, black bands; (3) basal three-fourths of pronotum between sublateral carinae and lateral margins always black, whereas in



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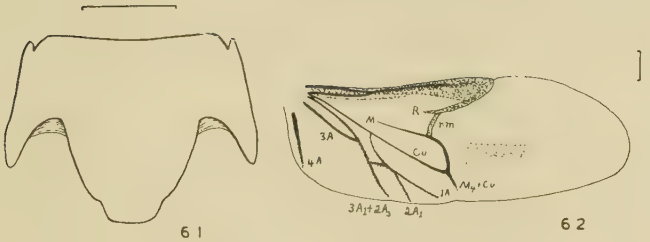


Figs. 60–62.—(60) *Gyrelmis simplex* sp. n. Dorsal view to give general appearance, (61) Ventral view of prosternum of *Gyrelmis brunnea* sp. n., (62) Wing of same. Venation after Forbes.

maculata this region is frequently partly or entirely brown; (4) male genitalia (fig. 66) with median lobe projecting distinctly instead of slightly beyond apices of parameres; (5) parameres of male genitalia without numerous hairs on inner side near apex; and (6) anterior margin of mid-gut always with five caeca, whereas that of *maculata* has five or six caeca here.

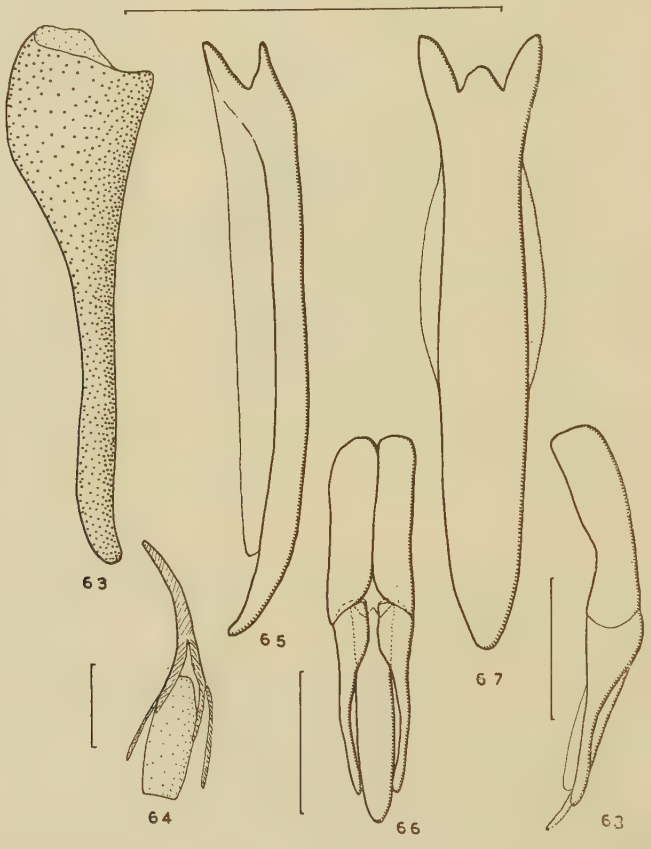
Female : Externally similar to male.

Type : A male in the collection of the British Museum (Nat. Hist.). Brazil : Pará, 55 km. from Belem on Estrada de Ferro de Bragança, ix.1937 (*H. E. Hinton*).

Paratypes: 104, with same data as type; and 286, French Guiana: St. Laurent du Maroni, x.1937 (*H. E. Hinton*).

Gyrelmis pulchella sp. n. (figs. 69–71).

Male: Length, 1·75 mm.; breadth, 0·98 mm. Obovate, moderately convex. Externally very similar to *G. maculata* and *G. brunnea*, but may be distinguished from both as follows: (1) antennae unicolorous instead of bicolorous; (2) pronotum with sublateral



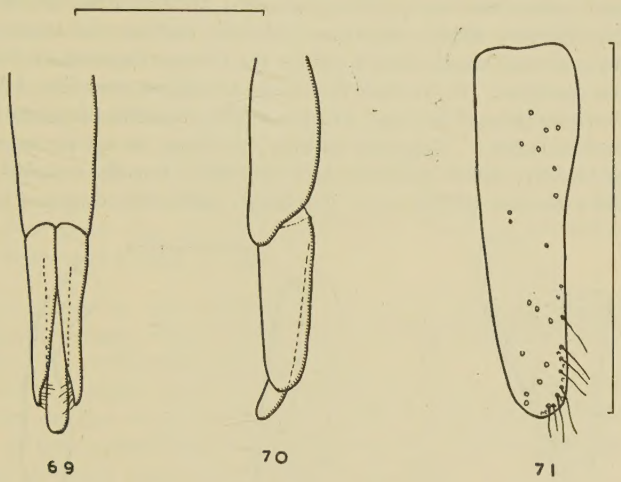
Figs. 63–68.—*Gyrelmis brunnea* sp. n. (63) Dorso-lateral view of paramere of male genitalia, (64) Spicule of male, (65) Left lateral view of median lobe, (66) Dorsal view of male genitalia, (67) Dorsal view of median lobe, (68) Left lateral view of male genitalia.

carinae very prominent (for this genus) and extending from base to apex, whereas in *maculata* and *brunnea* they do not extend beyond apical eighth; (3) pronotum with a complete median longitudinal reddish band and with remainder of surface, except for middle anterior fifth, black, whereas in *maculata* there are two median black bands and in *brunnea* there is a single median black band; (4) elytra black with basal seventh of intervals two to six, discal part of three, and apical sixth of two and three brownish, whereas in both *maculata* and *brunnea* the elytra are brownish with dark brown or black vittae; (5) prosternal carinae extend to apical third instead of being confined to basal fourth or third; (6) gibbous sides of prosternal process with a feeble, dorsal stria, whereas there is no trace

of such a stria in *brunnea* or *maculata*; and (7) the male genitalia (figs. 69–71) are very different in shape.

Female : Unknown.

Type : A male in the collection of the British Museum (Nat. Hist.). French Guiana : St. Laurent du Maroni, x.1937 (*H. E. Hinton*).



Figs. 69–71.—*Gyrelmis pulchella* sp. n. (69) Dorsal view of male genitalia, (70) Left lateral view of same, (71) Dorso-lateral view of paramere.

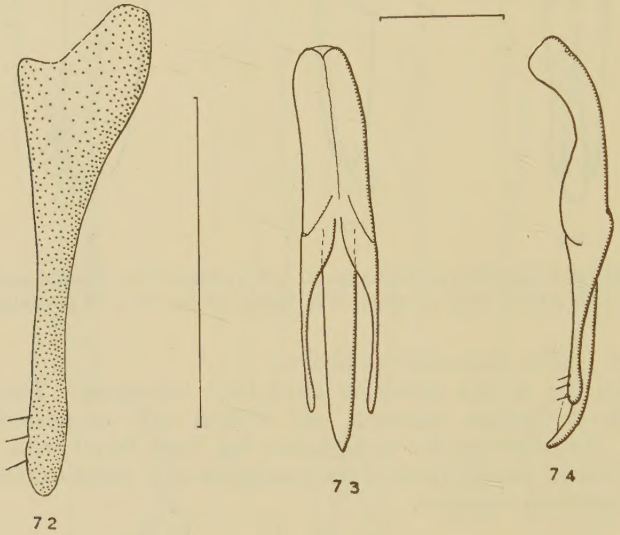
Paratype : 1, with same data as above.

The hind-wings of one specimen have been examined. They are much reduced, without distinct venation, and extend only to posterior third of metanotum. No other species of *Gyrelmis* has been found with even partly reduced hind-wings, though most of the specimens of *G. pusio* examined had the elytra feebly soldered together.

Gyrelmis nubila sp. n. (figs. 12, 72–74).

Male : Length, 2·46 mm.; breadth, 1·12 mm. Broadly oval to obovate, strongly convex. Cuticle shining, black; anterior middle fifth of pronotum, basal sixth of elytra, middle of second and fourth intervals, and apex of second and third reddish-brown; antennae and mouth-parts rufo-testaceous; legs and ventral surface rufo-piceous. *Head* without distinct impressions; surface on middle region (except just behind fronto-clypeal suture where it has fine punctures separated by four diameters) with punctures as coarse as facets of eyes and confluent to separated by one diameter; surface between coarse punctures microscopically punctate. Clypeus with fronto-clypeal suture well impressed, feebly arcuate, nearly straight; anterior margin moderately shallowly, arcuately emarginate for its entire breadth and angle on each side obtusely rounded; surface with punctures about half as coarse as facets of eyes and separated by one to three diameters, towards sides more densely punctate. Labrum with anterior margin nearly truncate and angle on each side broadly rounded; surface on basal fourth nearly smooth, elsewhere with punctures as fine as those of clypeus, separated by three to four diameters, and each giving rise to a fine, testaceous hair which is four to ten times as long as its respective puncture. *Pronotum* across broadest point, which is at base (across basal third only 0·87 mm. broad),

than long (0·90 mm. : 0·76 mm.) and base broader than apex (0·90 mm. : 0·60 mm.). Sides broadly and scarcely noticeably sinuate before hind angles. Sublateral carinae moderately prominent and extending from base to apical eighth. Pronotal disk evenly convex; impressions near base at each side of scutellum subovate, deep, nearly as broad as scutellum, and separated by a distance equal to about half breadth of scutellum; punctures of middle disk oblong to round, as coarse to slightly coarser than facets of eyes and separated by one to two diameters; surface between punctures smooth; towards base and apex punctures become finer and sparser; surface between sublateral carinae and lateral margins on anterior half with punctures about a fourth coarser than facets of eyes and seldom separated by as much as one diameter. *Elytra* more than twice as long as pronotum (1·72 mm. : 0·76 mm.) and with broadest point (1·12 mm.), which is at about middle, distinctly broader than broadest point across humeri. Epipleura entirely tomentose except for extreme anterior margin. Apices broadly, feebly produced and conjointly, broadly rounded. Sublateral carinae prominent with inner slightly more prominent; outer extending to a point opposite



Figs. 72–74.—(72) Dorso-lateral view of paramere of male genitalia, (73) Dorsal view of male genitalia, (74) Left lateral view of same.

middle of third abdominal sternite. Disk with sutural stria distinct but very shallow and other striae not noticeably impressed; strial punctures round, deep, a third or fourth as broad as intervals, and separated longitudinally by one to two diameters; punctures on basal fourth and apical fifth sparser and much finer. Intervals nearly flat; surface with punctures a third to two-thirds as coarse as facets of eyes and separated by three to five diameters. *Scutellum* flat, triangular with base and sides feebly arcuate, and broader than long (0·19 mm. : 0·16 mm.); surface with a few sparse, fine punctures as coarse as those of sutural interval. *Prosternum* with carinae broad, moderately prominent, extending to apical third (not including process), and feebly converging anteriorly; prosternal process broadest at base, posterior margin feebly rounded, and sides strongly, broadly gibbous and with only an occasional puncture; tomentum anteriorly separated from carinae by a distance equal to half of fourth antennal segment; surface with punctures about as coarse as those of pronotal disk but slightly sparser; anteriorly feebly, indistinctly strigose; apical third of process with a broad oval depression on each side. Hypomera tomentose except for a short area near posterior ventral margin. Metasternum with median longitudinal line

fine, shallow, and extending to anterior fifth; discal carinae prominent, complete, and moderately diverging posteriorly; surface sculptured like middle region of prosternum. Metapleura entirely tomentose and with a broad, oval depression near anterior margin. *Abdomen* with carinae of first sternite broad, very prominent, complete, and feebly converging posteriorly. Middle area of sternites with anterior third of first punctate like extreme sides of pronotum, elsewhere and other sternites punctate like metasternal disk but with punctures becoming finer posteriorly; surface between punctures nearly smooth. *Legs* with trochanters, basal half of front femora, basal third of middle, and basal half of posterior side of hind femora tomentose. Tarsi with fifth segment very slightly longer than combined length of four basal ones (hind tarsus, 0·30 mm. : 0·28 mm.); claws broad, with a slight but distinct basal tooth. *Male genitalia* (figs. 72–74) with median lobe extending distinctly beyond apices of parameres, evenly narrowed to apex, and apex moderately curved ventrally; parameres feebly broadened near apex and with three, erect seta on apical ventral margin. *Alimentary canal* with five caeca on anterior margin of mid-gut. *Male reproductive system* (fig. 12) with special tubular vesiculae seminales.

Female : Externally similar to male.

Type : A male in the collection of the British Museum (Nat. Hist.). Brazil : Matto Grosso, Porto Velho, viii.–ix.1937 (*H. E. Hinton*).

Paratypes : 17, with same data as above.

Variations : A slight amount of variation has been noted in the density of the punctures on the various sclerites. This is particularly noticeable in the punctation of the metasternal disk which in some specimens has the anterior half or third as finely punctate as elytral intervals.

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